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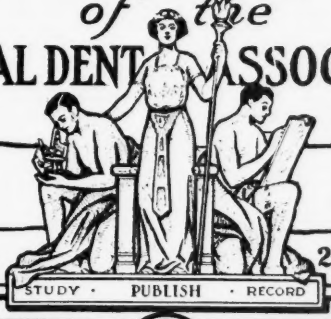

VOLUME VI NUMBER ONE

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JANUARY, 1919

John V. Conzett, D. D. S.—*Frontispiece.*

Military Plastic and Oral Surgery.—(Colored Illustrations.)—*Black.*

Efficiency of Medicaments for Sterilization of Tooth Structures.—*Hartzell.*

The Care of the Eyes.—*Wescott.*

Ten Aims for the New Year 1919.—*Editorial.*

Victory of the Old Year and Our Visions of the New.—*Editorial.*

The Dental Review Suspends.—*Editorial.*

Success of the Sale of Christmas Stamps.—*Editorial.*

Military Plastic and Oral Surgery—*Editorial.*

Relief Fund Department.

1919 Aim 32,000 Subscribers

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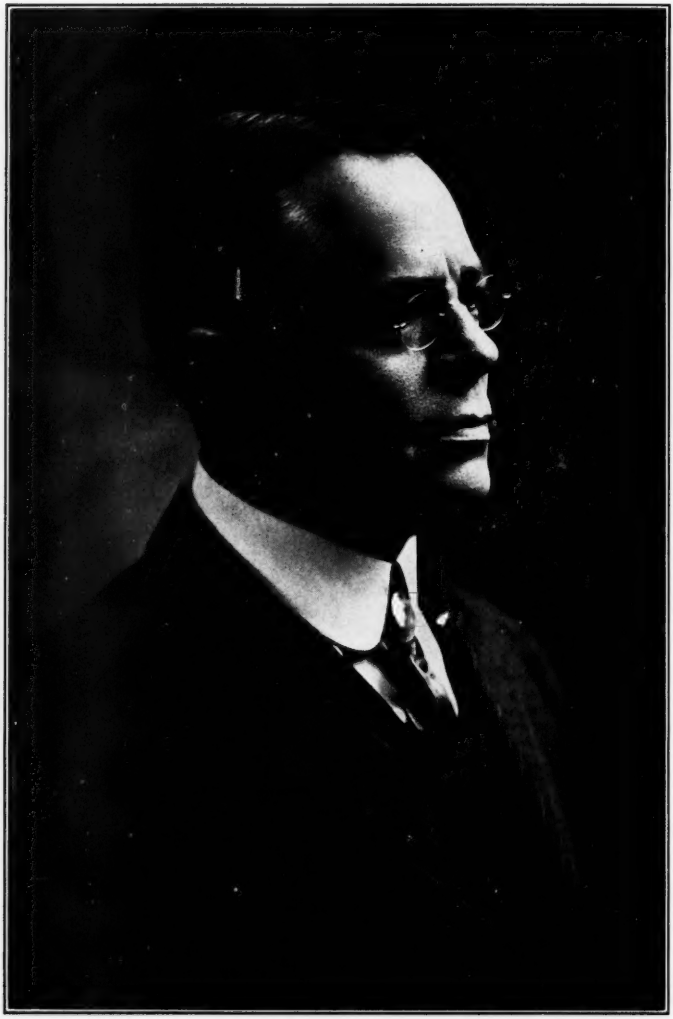


JOHN V. CONZETT, D. D. S., DUBUQUE, IOWA.
President-Elect National Dental Association.

THE JOURNAL
OF THE
National Dental Association
VOL. 6 JANUARY, 1919 NO. 1

Original Communications.

MILITARY PLASTIC AND ORAL SURGERY.*

A Series of Four Lectures Reviewing Some of the Recent Literature.

By Carl E. Black, A.M., M.D., F.A.C.S., Jacksonville, Illinois.
Chief Surgeon, American Red Cross Commission to Greece.

Lecture 1. The Extent of the Literature; Comparative Value of Books and Current Journals; Groups of Articles on Plastic and Oral Surgery; the Relation of the Medical Library to the Community; Asepsis and Antisepsis in War Surgery; New Studies of the Treatment of Wounds; the Establishment of the Division of Plastic and Oral Surgery an Important Event.

Lecture 2. General Surgical Considerations; Treatment of Wounds; Asepsis and Antisepsis; New Factors in the Treatment of Wounds; Studies of Tissue Injuries by Gunshot Wounds; Irrigating Solutions, Antiseptic Pastes.

AT first thought it might seem that the department of surgery included in this course would constitute a rather small division of surgical literature, but the more one looks into the matter the wider the range of subjects becomes to get a comprehensive view of what the profession is doing, or should do along this line.

To give you some idea of the amount of literature involved in this division, I recently made an estimate of titles from the last two years of surgical current literature. You will be surprised perhaps, to know that almost without effort I secured more than twelve hundred titles on the surgery of face and neck and can-

*Delivered before the Officers' School of Plastic and Oral Surgery. Established by order of the Surgeon-General of the Army, Northwestern University Dental School, 1918.

not by any means claim to have completely covered all the periodicals. Among the headings may be mentioned anatomical considerations, physical examination, inflammation, infection, abscess formation, infections confined to the mouth, injuries to the mouth and jaws, infections confined to the teeth, the peridental membrane, the maxillary bones, motor and sensory nerve disturbances from injury, hemorrhage, shock, anesthesia, dislocations, excisions, resections, surgical technic in general, deformities and defects due to injuries. These may be mentioned as some of the subdivisions of the subject. There remain purely technical questions which will be presented by others.

For convenience, I have divided the literature under several heads, each of which has been given a number and the bibliography is arranged in the same order.*

The divisions:

1. General Surgical Considerations of the War.
2. Military Clinical Organization for Special Surgery.
3. First Aid—Civil and Military.
4. Surgical Technic.
5. Wounds—General Treatment.
6. Infected Wounds.
7. Infected Wounds—Open treatment.
8. Infected Wounds—Antisepsis.
9. Infected Wounds—Pastes; bismuth, iodoform, paraffin.
10. Infected Wounds — Dichloramine T.
11. Infected Wounds—Isotonic sodium hypochlorite solution—Carrel-Dakin-Daufresne.
12. Infected Wounds—Light and air.
13. Infected Wounds—Indications for secondary suture.
14. Shock.
15. Hemorrhage—Blood vessel surgery.
16. Leucocytes — Coagulability—Blood-pressure.
17. Transfusion.
18. Bacteria and Bacteriology.
19. Anthrax, Gas Gangrene, Tetanus and other special infections.
20. Prophylactic Vaccines.
21. Jaws—Injuries.
22. Jaws—Fractures.
23. Plastics.
24. Dental Procedures.
25. Oral Surgery.
26. Removal of Foreign Bodies.
27. X-Ray in Injuries of Face, Jaws and Head.
28. Injuries of Neck, Salivary System, Pharynx and Larynx.
29. Nerve Injuries.
30. The Sinuses.
31. The Nose.
32. Burns.
33. Skin, Fascia, Fat, Muscle and Bone Transplantation.
34. Anesthesia.
35. Post-Operative treatment.

*Note—The articles under each heading were assigned to members of the class and brief written reports were presented to the class. This consumed one hour each week and the other was taken for lectures.

Comparative Value of Books and Current Journals.

Before taking up the subject in detail, I will say a few words regarding the value of medical literature. The John Crerar Library has very kindly prepared a special list for students in the various courses given in Chicago in connection with the preparation for the work of the war. This list, while very valuable, is confined almost wholly to books. A number of periodicals are named in the list but they are simply references to bound volumes to be found in the library which you can consult for such facts as you may desire to search out. For the most part however, it is a list of references to books, government publications, dictionaries, works on anatomy, works on the practice of medi-

cine, works on hygiene and public health, hair and skin and teeth, etc. There is also a splendid list of works on military hygiene, and naval hygiene; also a useful list on food analysis, with references to works on first aid which are desirable, as are also those on injuries by gas and electricity. The nursing profession is well taken care of in the list, as is hospital practice. More than half the pamphlet is given up to diseases classified by systems, as for example the circulatory system, the respiratory system, the digestive system, genito urinary system, nervous system, etc. There is a good list on infectious diseases and venereal diseases. Surgery is especially well taken care of.

Some of these books we will refer to in detail. There is a very respectable list of books on surgery of the head, another good list on surgery of the thorax and the neck. As might well be expected, abdominal and pelvic surgery are well covered. There are not so many books on the extremities or the heart and blood vessels, but there are enough. The eye and ear are both well cared for. The list on operative and military surgery, including emergency surgery covering injuries and bandaging, is extensive. Every one is more than welcome at the John Crerar Library to use the books and journals which will be found on file. I trust each one will take advantage of this opportunity.

I wish to refer to the current literature as a part of one's armamentarium. If we analyze the way in which scientific facts are brought to the attention of the profession, we find that it is usually in the following manner: First, there is a period of experimentation in which facts and data are accumulated; perhaps a single case may be observed, or there may be records of a thousand cases of a particular kind. There may be laboratory work of an experimental character and data is kept of the daily routine; possibly there is animal experimentation, which has proved very valuable in many lines of our work. Take for example the work done many years ago by Nicholas Senn of Chicago on gunshot wounds of the abdomen, in which he used large numbers of dogs in carrying out a systematic series of experiments. The data was kept from day to day and finally when the series was finished, the results were worked into proper shape for presention to the profession. After accumulating the necessary data, it is usually presented to some medical society or before the college clinic. Here it is discussed for the first time; criticisms are made and new facts are brought out. Perhaps some one else is working along the same lines and another set of facts is developed.

The second step, as a rule, is the publication in a medical journal. Thus the subject appears for the first time in current medical literature, and comes to the attention of the general medical world, to receive free discussion and criticism. If it is an important subject, perhaps several publications are required before the author has made his work plain. Additional criticisms may appear from other authors. There may be several months or years of discussion before societies and in the journals, until finally the more important facts will be crystalized into a book.

I mention these details to show that this process practically always takes place before important matters get into the books. On an average books are five years behind the medical journals in bringing to us the facts of the progress of the profession. Of course they reach us in a much better shape in books than in journals. They have been redigested, so to speak, by the time they get into the books. Usually the first appearance of a subject in a medical journal is purely preliminary, but by the time it gets into medical books the facts are supposed to be well established

and fairly well accepted by the profession. We can place more reliance on what we read in medical books than what we read in medical journals. On the other hand, if we place our sole dependence on what we read in medical books we will be very much behind those who are good readers of current medical literature. For this reason I have always been impressed with the value of current medical literature. It is true that one reads a good deal that is useless and which must be discarded after the subject is worked out more thoroly, but there is a certain inspiration about current medical literature that one cannot get from any other source. It makes him a part of the development of his profession, a member of the fam'ly so to speak; the book reader may be only a visitor.

The Library.

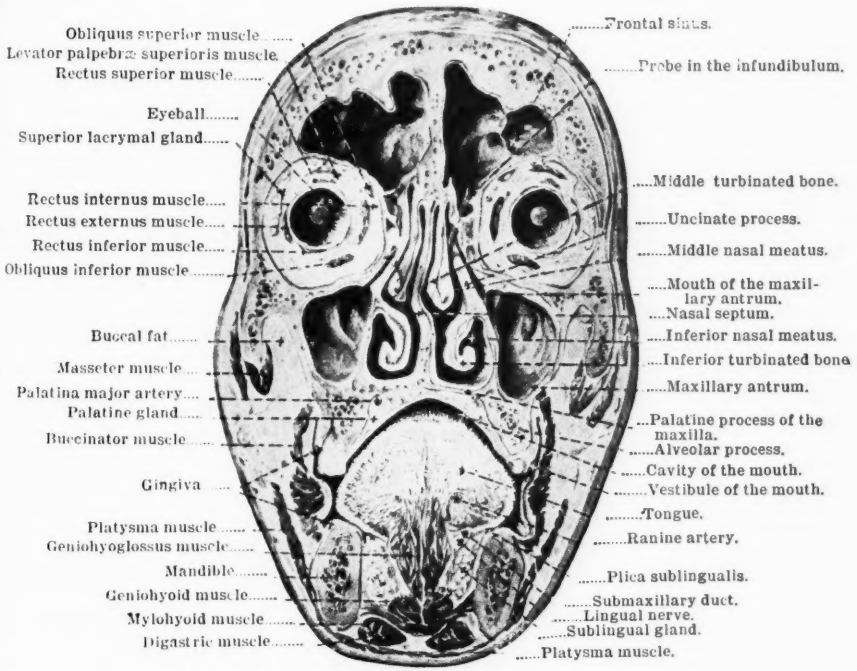
Webster defines a library as "a considerable collection of books kept for use and not as merchandise." According to this definition, emphasis is placed on the usefulness more than on any or all other qualities of a library. That there has been a wonderful awakening in the matter of libraries, both private and public, both secular and scientific, is patent to every one. This awakening has not been sudden nor without long preparation. It has been coincident with more extended and thoro education. The library is a part of our educational system and is now generally so accredited. To the practical physician it is much more. The word "library" is so intimately associated with culture, progress and achievement that it is hard to conceive of one without the other. Bacon says: "Libraries are the shrines where all the relics of the ancient saints, full of true virtue and without delusion or imposture, are preserved and reposed."

Who does not mourn the loss of the great Alexandrian Library, with its priceless treasures, and who can say how much of the world's progress was impeded thereby? The great and many sided Virchow has truly said: "All scientific research is really literary." Who can read the history of the life and achievements of Virchow, Darwin, Pasteur, Cohn, Broca, Hulings Jackson, Gross, Pepper, Osler, Davis or Senn without realizing the truth of Virchow's assertion. They were scientists, they made experiments, they studied their cases, they were practical everyday practitioners of medicine and surgery, with few exceptions, but above all that and more than all they were students of the literature of their profession. They read the great masters, they followed them, they learned them, and only by their aid were they able to write intelligently, interestingly and profitably. The colleagues we love most and who appeal to us most are those who know the history of their profession best. It is only thru the library, thru the books and periodicals which form our libraries, that we can know the history of our profession and the signs and progress of our times. Books and periodicals grouped together constitute libraries. Osler says: "It is hard for me to speak of the value of a library in terms which would not seem exaggerated. Books have been my delight these thirty years and from them I have received incalculable benefits. To study the phenomena of disease without books is to sail the uncharted sea, while to study books without patients is not to go to sea at all. To be a real value there must be a general and continuous use; the books must be made available and their use attractive. What exsuccous attenuating offsprings books would be but for the pabulum furnished thru the placental circulation of a library."

There is little doubt but the "love of study" and the "desire for knowledge" is the power which attracts most men

into medicine. How, then, are we to foster and cultivate this spirit thruout the medical career? Dr. Spivak has pointed out that "the medical school course is merely preparatory for what is to follow. Real knowledge of the medical societies are valuable means of educating, fostering and encouraging thought, but they have their drawbacks; the stated meeting that one is unable to attend, the subject that one is obliged to listen to, in which he is not interested, the idle and empty discussion from which there is no escape even in the best societies. There is but one grand institution that stands above all, that has all the virtues and none of the defects of those enumerated, and that is the library. On this shelf is my physiologic laboratory, on the other is my biologic institute, here is my anatomic science and art of medicine is post-graduate. Private practice is the first institution, a teacher grim and morose, but of the highest order if one only knows how to take advantage of its chastising lesson. Hospital practice is an institution wherein instruction is more systematized, the observation more certain and the results better noted. * * *

Figure 1.



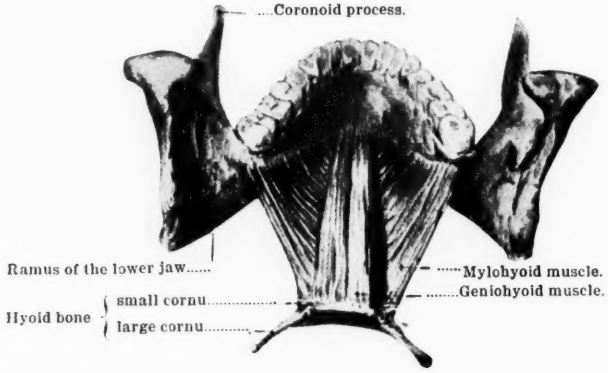
"Coronal section thru the face.—From Spaleholz." From, "Surgery and Diseases of the Mouth and Jaws." By Vilray Papin Blair. Third Edition, p. 3.

theatre, there my lying-in hospital. The records of medical progress, thousands of clinical reports, the teachings and the research of the best medical minds of all times and all places will be found in the medical library and they are available to every student."

Relation of the Medical Library to the Community.

Let us consider a moment the relation of the medical library to the community in which we live. This relation, of course, is entirely enveloped in the medical man himself. The members of the community expect when they call on the doctor for services that they will receive a correct diagnosis of the case, and that the case will receive the most approved treatment known to the medical profession. Thus we see the responsibility which confronts the doctor on assuming charge of any one sick or suffering. How far do we fall short in our duty of furnishing to our patient what he expects? Is he unreasonable in his expectations, in fact, have we not taught him to expect as much, and, if we have taught him to expect these things, and if he has the right to expect them, what shall we say to ourselves when he is disappointed? Have we made every effort available? Have we mastered what the masters have to teach us of the disease we assume to treat? Are we able to say that our diagnosis is as correct and our treatment as appropriate as the great teachers available to us in our literature can teach us to make them? Or are we shifting along with a smattering of knowledge which is continually leading us astray and filling the cemeteries with monuments which silently, but truly commemorate our lack of easily available knowledge? The people know something of the medical schools and their facilities and of the medical books and their qualities and of the medical journals and their progress. If we have made full use of all of these agencies for completing and perfecting our knowledge of the profession which we practice, we have no just cause to sorrow should we fail to meet the expectations of a patient. Too often it is

Figure 2.



"Muscles that form the floor of the mouth stretching between the concavity of the body of the mandible and the convexity of the hyoid bone.—From Spalholz." From, "Surgery and Diseases of the Mouth and Jaws." By Vilray Papin Blair. Third Edition, p. 4.

Plate I.

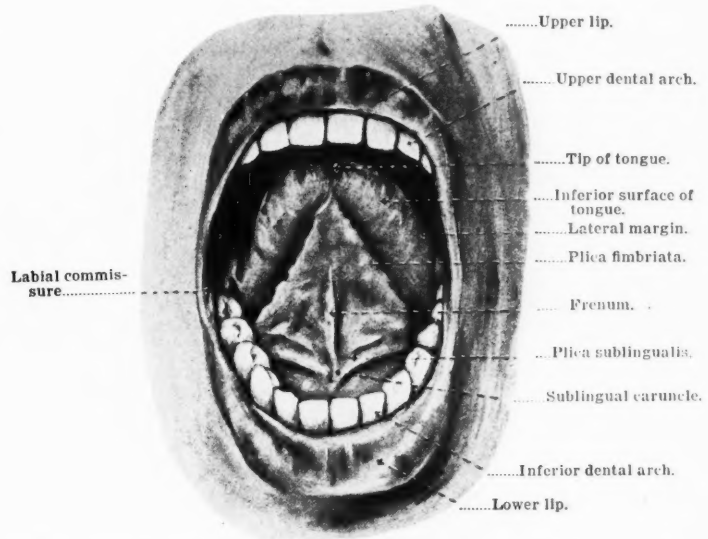
"Drawing of a patient with Haemolytic Jaundice accompanying a fatal general toxemia from an Anaerobic Infection." From, "General Septic Poisoning in a man suffering with 'Gas-gangrene' of the Arm." By Lt. Colonel Butler, R. A. M. C., British Journal of Surgery, July, 1915, 117.

plain that such effort at securing information has not been made. The community is interested to know whether, as medical men, we are making full use of these various agencies for keeping abreast of the times, which will enable us to bring to the sick child or ailing mother the very best in the medical progress. We should not be satisfied with less. We all know full well that the best is none too good.

There are then two very good reasons why a great deal of what we consider in this course in the literature of the subject should be taken from the current medical literature. This should be checked up by the use of the books and in many instances the books will be much more helpful than the current literature. But on the whole if we want to keep up with the times and get the real inspiration of the hour, we must keep close to the current medical literature.

The second reason is, that much will be found in current literature which cannot be found in other places. I mean much which is especially adapted to the needs of the work in hand. Progress has been especially recent and rapid in this field of surgery.

Figure 3.



"Mucous reflections under the anterior of the tongue.—From Spalcholz." From, "Surgery and Diseases of the Mouth and Jaws." By Vilray Papin Blair. Third Edition, p. 5.

Our government is using every effort to get this necessary information into the form of manuals for the use of its medical officers but this task is by no means completed and no doubt some of the manuals will be disappointing and will have to be rewritten. Consequently it is desirable to devote considerable attention to the literature which has appeared in the last few years on the subject of war surgery in its several departments.

The evolution of this literature is a

wonderful thing in itself. You all remember full well that it is only one or two years ago, that one could hardly get a hearing before a first-class medical or surgical society for any subject connected with the treatment of wounds. It is a subject which has been much neglected until recently. Every medical society meeting was taken up with subjects connected with the upper abdomen, the mid-abdomen, the lower abdomen, the pelvis, the brain, but there has been little time for the subject of the treatment of gunshot wounds or compound fractures. The day of compound fractures was long ago. That was the class of injuries which gave Lister his inspiration and on which he did his first great work in demonstrating to the world the value of the antiseptic treatment of wounds. Following Lister's announcement in 1867 regarding his method of treating compound fractures and other wounds there was an enormous literature, for that day, on these subjects. Then it was the treatment of wounds above the other subjects which were considered in medical society meetings. It had a wonderful hold and was altogether the most important subject ever taken up by the medical profession. That consideration was thought to be complete, many thought that the last word had been said on the use of antiseptics. We had settled down to treatment by the aseptic method. To a man coming into the world of surgery today even the word "Listerism" means little or nothing unless he takes pains to go back and study the history of the development of antiseptic surgery as begun by Lister, following out the work of Pasteur on the germ theory of disease.

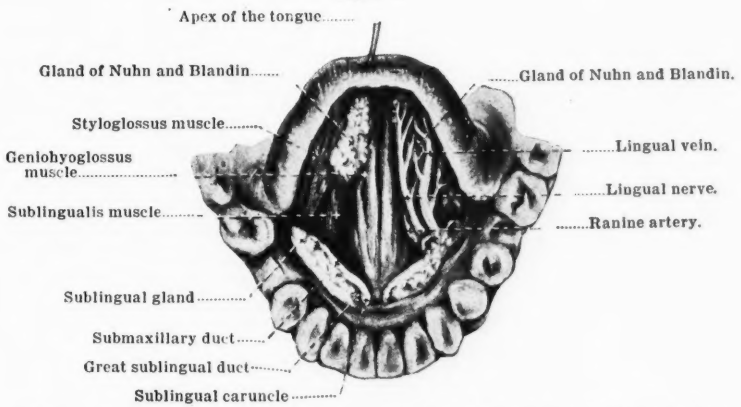
Now it transpires that just at the time when we thought the last word had been said on antiseptic surgery and in fact antiseptic surgery had been given a back seat and asepsis had entirely taken its place even in the treatment of wounds, we are awakened to a realization that after all antiseptic surgery is the great theme before the world as developed by this mighty war and we are confronted by the fact that even the leading surgeons are not well trained in the care of accidental wounds, gunshot wounds, bullet wounds, etc., and we find it necessary to "right about face" and study the whole problem of surgery over again. In fact many of us were born into the medical profession after the subject of wound surgery had been largely talked out and are finding it necessary to really begin at the bottom and study the whole question anew. Perhaps we have some advantage over the men who were familiar with the old Listerism and who had to rid themselves of that before they could take up asepsis. Many men never succeeded in the practical application of asepsis after they had once come to depend on antisepsis.

This change in the attitude of the medical profession toward whole questions of treatment of wounds and of compound fractures, of gunshot wounds, etc., is the thing which makes it necessary for us to come together in this way and take up the question anew and study it from its development. And the many failures which have arisen are warnings that the last word has not been said upon the use of antiseptics in spite of the wonderful developments of aseptic surgery.

I trust that in our study of the literature of war surgery we will be able to show how much real advancement has been made. While we have perhaps had only a meagre report of the failure of the early surgical work of the war we have had enough to show us that in the beginning the professional men of the various countries at war were deficient in their understanding of the necessities of the case. It is a mistake to think that these errors were entirely confined to the French and British. Germany and Austria have had to acknowledge their surgical errors. That this is true

is well known because American surgeons went to Germany early in the war and helped them in their work. Many of our men had charge of hospitals in Germany and did everything they could for their sick and wounded. From what we read in our literature it appears that the English were perhaps more deficient in the early days of the war than any others, but this is likely due to a habit which Englishmen have of being more frank in admitting their errors than almost any other people. We must first see our errors and then correct them.

Figure 4.



"Structure lying beneath and within the anterior part of the tongue.—Spaleholz." From, "Surgery and Diseases of the Mouth and Jaws." By Vilray Papin Blair. Third Edition, p. 6.

THE PLASTIC AND ORAL SURGERY DIVISION.

While surgery of the face and jaws has many points peculiar to itself it also has more points in common with surgery in general. Surgical principles are just as applicable to the surgery of this region as to that of any other region of the body and for this reason I have included many articles in the bibliography which may appear to be too general, but they cover this general application of the subject.

It is true, however, that up to this time few men in the profession have devoted special attention to surgery of the mouth and jaws as it is exhibited in the great war. Yet the mass of literature collected shows how rapidly the profession is looking into the subject and how eager they are to obtain information regarding it. In reviewing the literature I would especially ask you to give attention to one fact which stands out more prominently than any others, namely that in the treatment of all wounds, not only those of the mouth and jaws but of every part of the body, the greatest improvement and progress which has been made since the beginning of the war has come from early and thoro treatment.

The establishment by the Surgeon-General of this division of Plastic and Oral Surgery has brought together members of the medical and dental professions, which is to my mind, one of the most important things that has ever happened. It coordinates two branches which have heretofore been somewhat widely separated. Few gen-

eral surgeons have been expert in treating injuries to the jaws and there is much regarding the subject which has been only indifferently taught or not taught at all, by medical schools; on the other hand, few dentists have received sufficient training in surgical principles and technic.

These courses for the first time coordinate these two important branches into one department of medicine and surgery and I predict that they will never again be separated. We will probably have growing out of the war, as we find illustrated in the literature of the day, a class of surgeons who will in the future devote special attention to this subject, and who, like Major Blair and a few others, will be recognized as having mastered it from both points of view.

There are several good American books on the surgery of the face and jaws. Two deserve special mention, namely, that of Major V. P. Blair, of St. Louis, and that of Truman W. Brophy of Chicago. The work of Major Blair has been revised since the war began and everything considered is the best on this subject. The work of John D. Roberts of Philadelphia on the plastic surgery of the face is one of the best on that subject in any language. There are also several good English works on the subject.

Major Blair devotes Chapter I of his book to a careful anatomical and technical consideration of the region involved in this course of study. His illustrations for this chapter are taken from the work of the great Anatomist Spaldeholz. There is probably no better way to refresh our memory of the anatomy of this region than to reproduce on the screen illustrations used in this book.

*Figure 1 is the "coronal section thru the face" which shows the series of bony cavities covered with soft tissue which go to make up these parts. These partitions enclose spaces that contain either air or special organs. This section is especially valuable in showing the relation of the various sinuses and also in showing the tongue and the situation of the glands between the tongue and the mandible.

Figure 2 shows the mandible and the "muscles that form the floor of the mouth stretching between the concavity of the body of the mandible and the convexity of the hyoid bone."

Figure 3 shows "mucous reflections on the anterior surface of the tongue" and incidentally the relations of the lip and the teeth.

Figure 4 shows the "structures lying beneath and within the anterior part of the tongue;" especially valuable for the relations of the blood supply and the glands under the tongue.

Figure 5 is a "sagittal section thru the mid-plane of the face."

At the last meeting of the Western Surgical Association I reported the case of a boy four years old with a gunshot wound entering thru the upper lip and lodging in the body of the axis. All of the teeth on the left side of the upper jaw including both those which had erupted and the unerupted teeth were carried away by the ball and the crown of one tooth was carried in front of the ball and lodged in the body of the axis. Operating thru the mouth the opening in the pharynx was enlarged and the ball removed with forceps, with the probe I could then feel that there was still a foreign body in the bone. The wound in the bone was enlarged and with a forceps the crown of the tooth was then removed from the bony cavity. The boy made a good recovery. He still has a little stiffness in moving the head from side to side but otherwise is in perfect health and I think he will overcome his disability in time. He is young and the probabilities are that he

*The illustrations referred to in the text were shown on the screen by reflectoscope.

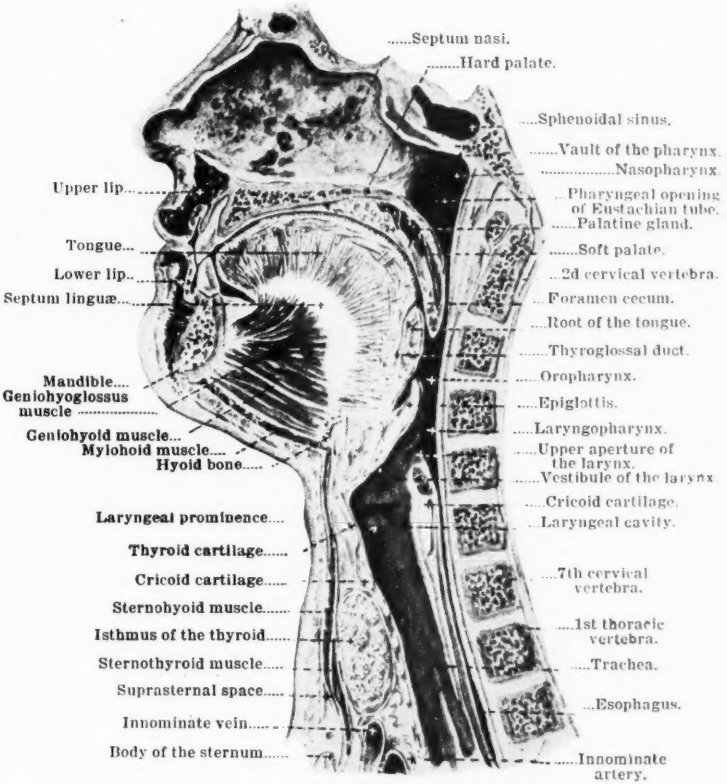
will make still further improvement. Several teeth on the upper left side of the jaw will be missing.

Figure 6 shows the "dorsum of the tongue" and especially the epiglottis, the tonsils and the lingual tonsil.

Figure 7 shows the "submucous structures of the palate and fauciaî pillars."

Figure 8 illustrates the "occlusion of the teeth and their position in the jaw bones."

Figure 5.



"Sagittal section thru the midplain of the face.—From Spalholz." From, "Surgery and Diseases of the Mouth and Jaws." By Vilray Papin Blair. Third Edition, p. 8.

FIRST YEAR IN WAR SURGERY.

In July, 1915, the great French surgeon Tuffier discussed in the "British Journal of Surgery" (July, 1915, p. 110) the first year's work in war surgery. I quote all that was said in that discussion regarding fractures of the maxillary bones and wounds of the face, as follows:

"Maxillary wounds are treated with great care by dentists who from the very

beginning apply to the fragments or fashion when necessary to replace them, bridges which render very great service."

In the light of the literature of today on this subject this seems a very scanty dismissal. Even then it was beginning to be borne in upon surgeons that the method of treating these wounds must be changed and improved, and under the general heading of war surgery the author gives the following advice regarding injuries:

"The grave infection of nearly all wounds received in warfare, requires the absolute necessity of rapidly transporting the wounded to a well equipped hospital for which numerous motors are absolutely indispensable. As regards the wound itself, the earliest possible extraction of foreign bodies especially those from artillery fire; Chassaignac's drainage; perfect immobilization of bones and of articulations, and the quickest possible disinfection of the wounds are my suggestions for treatment at the front. The great importance of all these points is incontestable. With regard to the question of antiseptics there exists a difference of opinion; every surgeon extols his own method. The usual antiseptics have gone bankrupt; new ones must be found with a more permanent action. Researches in this direction of the highest importance and necessity are being made. For myself I entirely share the opinion of Wright and Watson Cheyne. In all cases, however, we must rely on light, good air, and free evacuation of discharges rather than on any special antiseptic except, perhaps, hypochlorite of magnesia. The same may be said in regard to sero-therapy. No polyvalent serum, no specific serum, can make the patient safe from infection. Only the preventive antitetanic injection is of use. * * * * * After tetanus the most serious infection is gas or emphysematous gangrene."

This same number of the "British Journal of Surgery" contains several interesting illustrations of wounds of the head and face. (These were shown on the screen.) Before leaving this number of the British Journal of Surgery I wish to show you a "Drawing of the Trachea of a patient who died 36 hours after being gassed." See Plate II.

"He was deeply cyanosed and lightly delirious. In the actual specimen the most striking feature was the abrupt line of transition from the purple plum-colored mucous membrane of the pharynx to the healthy pinkish white tint of the unaffected oesophagus at the level of the thyroid cartilage. All the surfaces over which the irritant gas played are deeply injected and discolored. There was, however, very little oedema in the trachea and no inflammatory membrane had been formed. Curiously the larynx was in most cases free from oedema and irritation. The voice rarely became hoarse and the dyspnoea at any rate after the first few hours was never caused by laryngeal obstruction. This extreme congestive irritation was evident in almost all the fatal cases before the use of respirators. The protection devised later prevented this injury to the pharynx and trachea even in men who died of inflammatory oedema of the more delicate lung tissues. In these cases if the patient survived the asphyxiation of the first few days his color soon became normal again but the dispnoea persisted for some time and a cyanotic tint at once returned to the face when any muscular effort was made."

We will not attempt to follow any particular journal or series of articles in chronological order, but will select articles which will fit in with a somewhat orderly subdivision by subjects as already outlined. Naturally we should first consider the tissue involved. I have collected considerable material from the British Journal of Surgery, because it is more voluminously illustrated than any other publication and also because

its editorial committee has been giving special attention to the question of wounds and injuries.

Every member of this course should have a copy of the British Journal of Surgery for July, 1917. It is sort of a text book for wounds and injuries of the head and face. The following is a list of its titles on these subjects:

1. Inter-relation between Radiography and Surgery of gunshot wounds of the Head, by Capt. H. E. Gamlen and Capt. S. Smith.

2. Repair of skull injuries by Perforated Plates, by A. B. Mitchell.

3. Repair of Cranial Defects by Cartilagenous Grafts, by H. L. Warren Woodruffe.

4. The Carrell Treatment of Wounds, by Col. G. Barling.

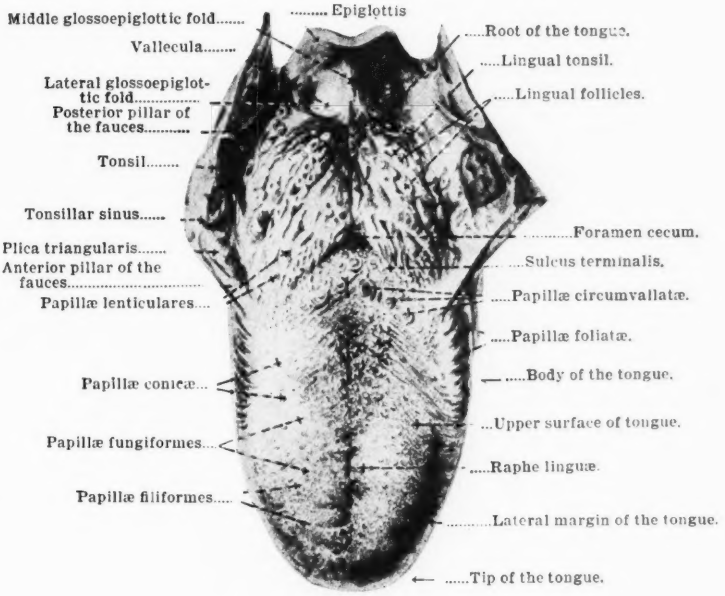
5. Treatment of Hemorrhage from Gunshot Wounds of Face and Jaws, by Maj. V. H. Kazanjian and Capt. Harold Burrows.

6. Report of Oral and Plastic Surgery on Prosthetic Appliances, by Maj. A. C. Valadiar and Capt. H. Lawson Whale.

To name the titles does not give the full importance of this issue of the British Journal of Surgery. Each of these articles is beautifully illustrated and contains much of the most recent French and British experience.*

Two of these articles are of especial

Figure 6.



"Dorsum of the tongue.—From Spaleholz." From, "Surgery and Diseases of the Mouth and Jaws." By Vilray Papin Blair. Third Edition, p. 9.

*The pictures illustrating each article were thrown on the screen by the reflectoscope.

importance. The first on the treatment of hemorrhage caused by gunshot wounds of the face and jaws, which is well illustrated showing a number of types of injuries, calling especial attention to concealed hemorrhage and secondary hemorrhage in this region. The article contains the best of advice on the two subjects which I have found.

It also shows a number of methods of fixing the jaws by wires and controlling hemorrhage by clamps. It has the interesting and instructive radiogram showing numerous fragments of shell and pieces of bone distributed thruout the tissues. It presents a number of original drawings showing the anatomy of the face and jaws (Figures 12, 13 and 14) which are not found in books on anatomy and which are exceedingly useful in understanding the effects of gunshot wounds and the application of the newer methods of treatment. In conclusion it reports thirty-two cases in considerable detail. The article entitled "Report of Oral and Plastic Surgery, and on Prosthetic Appliances" is especially valuable. I have found nothing else in the literature which compares with it for practical instruction in this branch of surgery. The illustrations are numerous and show each case in its several stages from the original injury to the conclusion of the final plastic operation necessary to restore the face. There are twelve full page illustrations following cases from the beginning to the end and some of the groups of pictures contain as many as twelve separate pictures in different stages of the same case. No doubt, sooner or later the author will put this work in book form. Any first-class medical library will supply the journal.

GENERAL SURGICAL CONDITIONS.

There are several papers and addresses which every member of the profession should read, not because they are so directly applicable to the immediate subjects of this course as for the general information and inspiration which they contain. Others should be read because of their direct instruction as to better methods of treating war wounds as well as those of civil life. Notable among the first is the address of Dr. Charles H. Mayo, of Rochester, Minn., as president of the American Medical Association, delivered at the New York meeting in June, 1917. I quote a few sentences:

"The medical profession should feel proud of the position it has taken in the affairs of the world. It has been second to none in its progress, and medicine has become nearly an exact science. The exalted position of medical men thruout the world's war has become accepted and has given them an opportunity to apply wholesale, as it were, the newer methods of prevention and treatment of disease by adopting at once fixed medical standards. The enormous value of this practical application relieves the necessity of a slower advance by discussions with the ignorant and by overcoming obstructionists. Hundreds of our medical men, appreciating the needs of the people as well as the requirements of soldiers, have long since accepted medical service to aid humanity in all the countries of Europe."

"The medical profession was first to mobilize, and has been signally honored by the government in having given to it the first flag to be carried abroad, thus signifying our country's active entrance into the war. No worthier representative of the profession could have been chosen as standard bearer than Dr. George W. Crile, who had done so much to develop the base hospital idea."

Dr. Mayo then proceeds to discuss comparatively America and Germany in the development of the medical and surgical professions and certainly makes out a splendid case in favor of American medicine. He does not fail, however, to give reasonable credit to Germany for the many things which she has accomplished. Many of the great names which have given lustre to American medicine are mentioned and many of the great achievements in medicine and surgery by Americans are brought out

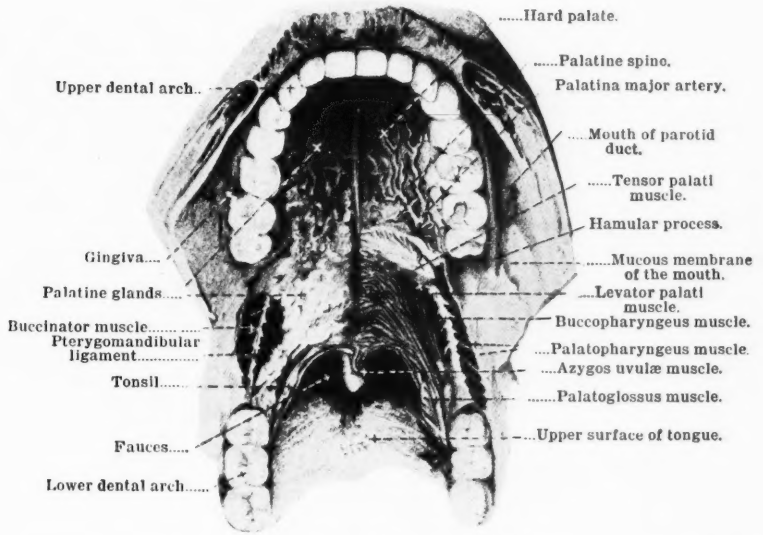
Plate II.

"Drawing of the Trachea of a Patient who died thirty-six hours after being gassed. Note the abrupt line of transition in color from purple to a healthy tint, at the level of the trachea." From, "Cases of Gas Poisoning Among the British Troops in Flanders." By Col. Sir. John Rose Bradford, K. C. M. G., C. B., F. R. S., A. M. S., and Capt. T. R. Elliott, F. R. S., R. A. M. C., British Journal of Surgery, October 1915, 237.

in splendid relief. He does not fail to remember American dentistry and I quote the following paragraph in this connection:

"American dentistry has made a place for itself in the world and America stands at the head of all countries in the care of the teeth. We are all proud of the work of American dentists. We may pay our tribute also to the American nurse who has distinctly elevated the nursing of the world and the care of the sick. Her experience and training make her the best wife and mother and a leader in support of the best in education and discipline in her community."

Figure 7.



"Submucous structures of the palate and faucial pillars.—From Spalcholz." From, "Surgery and Diseases of the Mouth and Jaws." By Vilray Papin Blair, Third Edition, p. 13.

If one has any special interest in the history of military surgery he should not fail to read the article:

"The influence exerted by the military experience of John Hunter on himself and on the military surgeon of today," by G. H. Makins (British Journal, Feb. 17, 1917, p. 213). He concludes the Hunterian oration by a consideration of the opportunities of research Hunter's military life afforded him, and compares them with those enjoyed by the present generation. "The pathologic anatomy of the lesions produced by gunshot injury to the brain, the spinal cord, the lungs, heart and the abdominal viscera has been worked out to an extent that will leave little to be desired. New facts regarding cerebral localization and the functions of the spinal cord have been noted, while others founded on animal experiment alone have been confined by injuries comparable to the knife of the physiologist. Observations regarding the fevers of the field have been accumulated, an enormous practical experience of the value of the protective inoculation for enteric fevers has been acquired while the prophylactic value of tetanus antitoxin and its influence in modifying the character of a subsequent attack has been placed beyond the region of doubt. It is not perhaps too much to expect that not only the acquisition of this extended knowledge, but also the manner of its acquisition, will exert an enduring influence upon the workers to whom we are indebted for it."

One of the best articles of the year is entitled "The Development of British Military Surgery at the Front," by A. Cowlby and D. Wallate (British Medical Journal, 1917, Vol. I, p. 705.)

These authors have been among the most valuable contributors to war surgery during the whole period of the war and this article is somewhat in the nature of a summary of their observations. Regarding wounds they say:

"The impossibility of disinfecting a wound at the front by the use of first-aid dressing is acknowledged and well recognized. A clean dressing is applied and kept in situ until a favorable opportunity for a redressing. The time for the latter is fixed as early as possible, when all the exposed and torn tissues, except in the smallest wounds, are excised. This is especially recommended in the case of tissues ingrained with dirt and portions of clothing. Free drainage is next established. Unless so treated wounds in France and Belgium become heavily infected in two or three days."

"The military surgeon of experience is always solicitous about caring for the wounded on arrival at the hospital or casualty clearing station. Nothing has greater bearing on the chances of subsequent recovery than the efforts to combat the effects of shock, bleeding, exposure to cold and the want of sleep and food. Severe pain must also be combated, and exhaustion bordering on collapse as a result of a hazardous journey over broken roads has to be carefully treated."

I also quote in full what the authors say about head injuries, as that is directly applicable to our particular work:

"Head injuries: In the early part of the present war and in all recent wars, gunshot injuries of the head were operated upon promptly whenever there was hope of recovery. The wounds of entrance and exit were cleansed of loose fragments of bone, foreign metallic fragments and all dirt. The British surgeons in the Anglo-Boer War advocated operation at the earliest time. They operated under fire, and by candle light at night instead of delaying a few hours. Later operations to them meant sepsis and sepsis meant encephalitis, abscess, hernia cerebri and death."

"Colonel Sargent advocates a delay of twenty-four hours or more because after injury the brain is liable to be oedematous and to extrude if operated upon while in the condition. Again, a moderate delay is beneficial in that it allows adhesions to form between the dura and pia mater, thus lessening the chance of a spread of infection over the brain surface."

"Experience in this war has brought out the following significant facts:

1. Cases which arrive at the base hospital unoperated upon did better than those operated on at the front.

2. It has been noted that patients kept quiet at the place of operation do very well, while cases operated upon and apparently doing well are apt to arrive in bad condition if they are evacuated early.

It is not in order to either operate at the front and keep the patient quiet, or to evacuate him as soon as possible to the base before operation. The patient should not be operated on and then evacuated forthwith.

Special hospitals for head cases are erected at the front. On arrival at the casualty dressing station they are examined and dressed. If the pulse is low they are sent to the special hospital; if the pulse is rapid they are put to bed and evacuated later if they improve. The technic is as follows:

1. Wound in the soft parts and soiled fragments of bone should be excised.

2. There should be exploration in a limited way for missiles and bone fragments.

3. Drainage is not strictly necessary. The exposed brain is covered with scalp, also the bone and dura, either by simple suture, pericranial flap, or relieving incisions formed by under-cutting the scalp. A drain introduced under the scalp may be employed. By this method hernia cerebri is not as frequently seen.

4. In cases of depressed fracture over the longitudinal sinus there should be no interference; they should be left alone (Sargent and Gordon Holmes.)

5. Dura should not be opened if it is found intact; true compression of the brain is seldom seen.

6. The use of novocaine and adrenalin locally often takes the place of general anesthetic. If this method is employed it should be preceded by hyocine and morphine or omnopon and scopolamine.

The foregoing plan of treatment may be summarized as follows:

1. Primary cleansing of the wound.
2. Transmission of the patient as soon as possible, to the hospital where he will convalesce.
3. Taking of X-ray pictures.
4. Limited and careful exploration of the wound for foreign bodies.
5. Excision of the scalp and bone wound.
6. Covering the exposed brain.
7. Closure of the wound with superficial drainage and prolonged rest in bed.

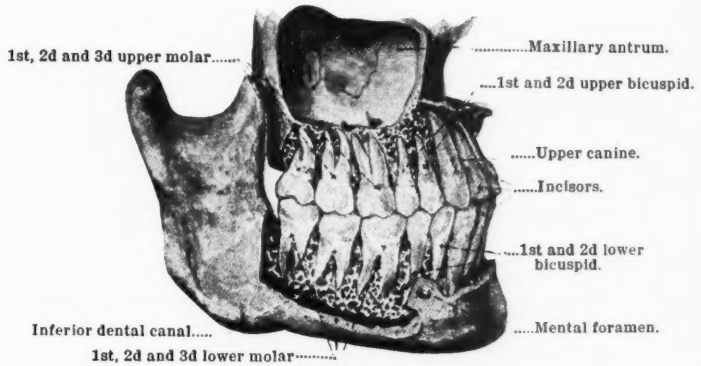
"The wound should first be thoroly cleansed of foreign matter, loose fragments of bone, and well drained by free incisions. The early deliberate and efficient cleansing of the wound is the basis of success, no matter what chemicals are used after it is completed."

The presidential address of the American Surgical Association at its meeting in Boston, May, 1917, by Samuel J. Mixer, M. D., of Boston, was entitled "Conservatism in Surgery," and contained many timely warnings and worthy suggestions, I quote two paragraphs which we should all take seriously to heart in our surgical work and should make up our minds to be neither timid nor rash in the prosecution of the treatment of wounds. All true surgery should be conservative surgery. I quote as follows from Dr. Mixer's address:

"Conservatism in surgery means the best use in our power of the means at hand for the saving of life, the relief of pain and deformity, without unnecessary mutilation. The man who is timid and the man who is rash are alike. Far from being conservative—amputation when necessary to save life may be the highest form of conservation, and, if it is best to amputate at or above the knee for gangrene, the foot alone should not be taken off because the shock is less and the immediate mortality lower."

"Timidity in the treatment of malignant disease is a common fault, the highest type of cowardice. True conservatism means going to the 'anatomical jumping-off place,' for no death is more to be dreaded than that from recurrence. Above all, is he a knave as well as a coward who refuses to operate on a desperate case, when life may perhaps be saved, for the sake of his "statistics"—statistics which have morally damned many an otherwise good surgeon, had better be juggled in some other way or even lied about. The true surgeon is never 'fearless.' He fears for his pa-

Figure 8.



"The Occlusion of the teeth and their position in the jawbone.—From Spaleholz." From "Surgery and Diseases of the Mouth and Jaws." By Vilray Papin Blair. Third Edition, p. 15.

tients, he fears for his shortcomings, his own mistakes, but never fears for himself or his professional reputation. His fear makes him a better man."

GENERAL TREATMENT OF WOUNDS—ASEPSIS AND ANTISEPSIS.

It would be inexpedient for me to devote any attention to the subject of military clinical organization, first-aid or surgical technic at this time, excepting as they are considered incidentally in the treatment of wounds. We should keep constantly in mind that wounds are of three kinds; first, wounds made by the surgeon—clean wounds, made under the usual aseptic precautions; second, soiled wounds—those which have become soiled from exposure to metal, clothing, dirt, etc., but in which there has not yet been time for the invading microorganisms to get a lodgement in the tissues; third, wounds which are infected—in which the micro-organisms of infection and suppuration have already made lodgement in the tissues and the battle between the bacteria and the tissue cells is fully on.

For ten years or more following the announcements of Joseph Lister in 1867, the great subject for universal professional discussion was the treatment of wounds; with the advent of aseptic method the profession settled down to the attitude that the last word had been said. Antiseptics were more and more considered objectionable and to be avoided, wherever possible. I was one of those strongly of this view and for several years up to the outbreak of the present war employed practically no antiseptics even in wounds which were already infected at the time they came under treatment. I am sure that this plan has given me more satisfactory results than was obtained from the usual antiseptic solutions, such as bichlorid, carbolic acid, boracic acid, lysol, the assential oils, etc. I believe our study of recent literature will show that my experience in civil practice is not inconsistent with the present advocacy of antiseptics in war wounds. It is a little difficult to understand the great revolution in stamping out infection which Lister brought about by the use of his strong carbolic sprays and solutions. Today if we use these we seem to promote and prolong the suppurative process. We believe that it is a well proved fact that any antiseptic which is strong enough to destroy the disease germ cells is also strong enough to destroy or seriously impair the resistence of the body tissue cells with which it comes in contact.

On account of the destructive effect of most antiseptics; iodoform has been much extolled by its advocates because it was claimed to strengthen the resistance of the tissue cells and thereby bring about a cure of the infection. A study of the literature will show that for twenty years there has been a gradual drawing away from the use of strong antiseptics. The solutions have gradually become weaker and to a large degree replaced by irrigations with physiological salt solution or plain steril water. Antiseptic ointments and plasters have largely disappeared and the aseptic regimen has been more and more in evidence.

Suddenly the profession is confronted with the care of wounds in a great war; wounds filled with fragments of shell, clothing, etc., in patients begrimed with the dirt of the fields and the trenches, who have been denied the civilized privileges of the bath and clean linen. The wounded have had no opportunity for even changing their clothing. Often they must wear it until it is completely impregnated with the germ bearing dirt of the street, the field and the trench. Dirt, dampness and lack of sunlight and water conspire together to produce all of the conditions which are necessary to the development and preservation of the most virulent and destructive of the bacteria of infection.

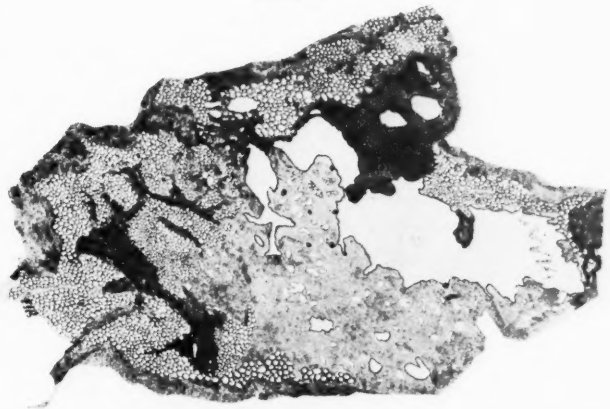
Our theories and our practices are all

upset and we have the problem of the environment of the patient forced on us in a new light. The methods of handling wounds in civil practice, when applied to the wounded in the war were found ineffective. Tetanus, gas gangrene, streptococcus, staphylococcus and other infections were almost unaffected by the usual methods and were unusually destructive in their virulence and mortality.

It was early apparent that while the cause and course of these infections were perfectly well known that the methods of handling them must be completely reorganized to adapt them to war. Some of the best investigators have been on the field in the several fronts for months and there is some prospect that the labors of Tuffier, Crile, Morrison, Wright, Carrel, Dakin, Taylor, Gosset Dewal and others is bringing practical results.

There are two papers which every surgeon who expects to take charge of the treatment of war wounds should carefully read. The first, is by Sir Watson Cheyne (British Journal of Surgery, January, 1916). Cheyne was a student of Lister and still is embued by much of the old Listerism. After all Listerism is the very foundation of our antiseptic regimen and we cannot consider the use of antiseptics without first having as a basis the theory and practice as taught by Lister. Therefore I wish to call your attention to a few paragraphs quoted from Cheyne's paper, a part of which is devoted to Lister's procedure:

Figure 9.



"Subcutaneous connective tissue, areolar tissue, and fat, showing track of shrapnel. Dense connective tissue to right and above, which is disorganized and filled with hemorrhage around the track. On the left, and abutting into the track, the capillaries between the fat cells are widely dilated and filled with leucocytes, in places so densely packed as to produce the dark patches seen in the areolar tissue. The intense black spots represent emplanted wool fibres (khaki). Entire area removed at operation twenty hours after injury." From, "Investigation of the histology of the tissues, immediate and remote from the point of injury, in gunshot wounds of the Liver, Spleen, Kidney, Intestines, Blood-vessels, Subcutaneous Tissue and Aponeurosis, and Muscles." By Captain E. F. Bashford, R. A. M. C., British Journal of Surgery, January, 1917, p. 449.

"It seems to me that at the present time there are no more important questions for the surgeon at the front to ask himself than these:

1. What was it that Lister did in the treatment of infected wounds which led to the great revolution in surgery which followed his work?

2. Why is it that I am not getting results similar to those which were obtained by Lister as long ago as 1866?

For it must be realized that the military surgery of the present day as regards results, has not advanced as one would have expected.

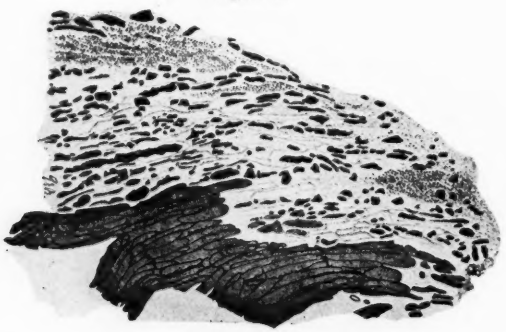
What, then, was it that Lister did which changed the whole aspect of affairs? Here is what he did in the case of a boy whose leg was crushed by the wheels of an omnibus.*

'When I saw the child,' Lister writes, 'after an unavoidable delay of three hours, he was greatly prostrated by shock as well as hemorrhage, so much so that amputation appeared likely to afford but a slender chance of life, altho the state of the injured parts seemed to admit of an alternative. The tibia, which was broken about its middle, lay exposed in a wound occupying almost the entire length and breadth of the inner aspect of the leg, reaching from the inner condyle of the femur to within an inch and a quarter of the tip of the internal malleous, the skin having been stripped back so as to lay bare the gastrocnemius as well as the bone. The large flap of integument was perforated about two inches from its edge opposite to the seat of fracture, and there was also an opening in the skin on the outer side of the leg, implying that the violence had acted with full force upon the whole thickness of the limb. Yet the bone was not comminuted, and the muscles, tho severely contused, were not much lacerated, while the anterior tibial artery was felt beating in the foot; and hopeless as would have been the idea of trying to save the limb by ordinary treatment, I determined to make the attempt by the help of carbolic acid."

"Now observe," says Cheyne, "what he did in this case, the fifth treated on his new principle, for it is most important in view of the exaggerated ideas promulgated by the number of surgeons at the present time as to the harm which may be caused by strong antiseptics. Observe, also, that the preparation of carbolic acid which he was using was very impure, and much more irritating than the purer material which is employed now."

"Chloroform having been administered, the acid full strength was applied with great freedom, the contused mass being repeatedly squeezed to induce the liquid to insinuate itself into all its interstices, including that between the riding fragments of the tibia. The flap of skin was then brought towards its natural position, and the lint soaked in the acid was placed upon the wide raw surface which

Figure 10.



"Portion of muscle lying beneath dense connective tissue seen in Figure 9. The muscle fibres at top of figure have been immediately killed by the violence of the missile, and are sharply delimited from the living muscle fibres, some of which show a proliferation of the nuclei of the sarcolemma. At the bottom, limit of surgical incision into healthy muscle. Twenty hours after the injury." From, "Investigation of the histology of the tissues, immediate and remote from the point of injury, in gunshot wounds of the Liver, Spleen, Kidney, Intestines, Blood Vessels, Subcutaneous Tissue and Aponeurosis, and Muscles." By Captain E. F. Bashford, R. A. M. C., British Journal of Surgery, January, 1917, p. 450.

*Note—While this is not a head or face case, the same principles apply.

still remained exposed and over the lint a piece of sheet tin. The other openings in the integument were similarly treated, and the riding of the fragments having been corrected by extension, the limb was laid on its outer side, with the knee bent, upon a pasteboard splint moulded to the leg and foot and strengthened by a temporary wooden splint. A porous cloth was applied over the tin to absorb the blood and serum which must escape from beneath its edges, and the whole apparatus was secured with a roller bandage."

"As regards the further progress of this case, the wound filled up with blood-clot which became firm and adherent to the walls of the wound. This clot remained there day after day becoming organized in its deeper part and no suppuration occurred. The tin plate was removed every day and fresh carbolic acid was painted on the surface of the clot so as to keep up the antiseptic action. After about a fortnight the detached edges of this crust of clot and carbolic acid were clipped away, and a lotion of sulphite of potash was applied over the exposed rim of the crust, to permit cicatrization, which the carbolic acid tended to check."

"Already in his third case Lister had observed organization of blood clot which was quite a new phenomenon to him."

'Speaking of this, he says:'

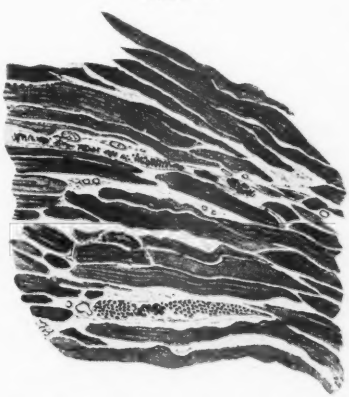
"Thus, the blood which has been acted on by carbolic acid, tho greatly altered in physical characters, and doubtless chemically also, had not been rendered insuitable for serving as pabulum for the growing elements of new tissue in its vicinity."

'And further, in speaking of healing in connection with this mass of clot, he says:'

"At length, nearly four weeks after the accident, I tore it (the clot) off from the vascular surface beneath which bled as I did so. The crust had preserved the subjacent parts from disturbance as effectually as if it had been a piece of living integument; and it is worthy of remark that the vascular surface below had not the pulpy softness of granulations, but was comparatively firm and substantial. The bit of crust still smelt of carbolic acid, tho none had been applied for five days."

"In the case which I have narrated a very interesting and instructive complication arose. On the fractured leg there was at one side a small wound which was not treated by carbolic acid. After some days it was observed that this sore, instead of healing, was increasing in size and presently hospital gangrene developed in it and caused a good deal of trouble. Thus we have the very remarkable fact that not only in the same patient but in the same limb, we have a large and very grave wound following an absolutely aseptic course, while in the vicinity a trivial wound became the seat of hospital gangrene. If, as Sir Almroth Wright suggests, the main value of antiseptics is due to their production of a flow of serum, why did that serum prevent hospital gangrene in the large wound and not in the small one. The difference between the two really lay in the presence or absence of the strong carbolic acid."

Figure 11.



"Muscle fibres adjoining those killed by direct violence, to show proliferation of the nuclei of the sarcolemma advanced in one fibre, abortive in another, and irregularly distributed in the rest of the fibres. Marked longitudinal striation and loss of cross-striation. Twenty hours after injury." From, "Investigation of the histology of the tissues, immediate and remote from the point of injury, in gunshot wounds of the Liver, Spleen, Kidneys, Intestines, Blood Vessels, Subcutaneous Tissue and Aponeurosis, and Muscles." By Captain E. F. Bashford, R. A. M. C., British Journal of Surgery, January, 1917, p. 451.

"Among Lister's early cases of compound fracture two developed abscesses, and in so far were failures; but there was no spreading infective disease, as was previously the case, and as the other cases had been successful

there was sufficient evidence to show that the failure in these two cases was due to some imperfection in the details of the procedure, and not to a faulty principle."

"At the time this paper was written he (Lister) had already progressed from the use of impure carbolic acid to carbolic oil and putty, and he refers to the treatment of psoas and other tuberculous abscesses with these preparations. To his delight he found that, when so treated, instead of suppurating freely after they were opened, as was formerly the case, and as I am sorry to say is frequently the case at the present time under the so-called aseptic treatment, suppuration did not occur, and the sinuses healed in course of time."

'Lister says:'

"I have opened numerous abscesses connected with caries of the vertebrae, hip, ankle and elbow and in all cases I have found the discharges become in a few days trifling in amount, and in many it has ceased to be puriform after the first twenty-four hours."

'He says, with regard to this new method of treating abscesses:'

"It is based, like the treatment of compound fracture on the antiseptic principle, and the material employed is essentially the same, viz., carbolic acid, but differently applied in accordance with the difference of the circumstances. In compound fracture there is an irregular wound which has probably been exposed to the air for hours before it is seen by the surgeon, and may therefore contain in its interstices the atmospheric germs which are the causes of decomposition, and these must be destroyed by the energetic application of the antiseptic agent. In an unopened abscess (he is here referring to tuberculous abscesses) on the other hand, as a general rule no septic organisms are present so that it is not necessary to introduce the carbolic acid into the interior. Here the essential object is to guard against the introduction of living particles from without, at the same time that a free exit is afforded for the constant discharge of the contents."

"Thus in this paper he already formulates the guiding principles of treatment in the two great classes of wounds viz., (1) Those inflicted accidentally, in which, therefore infection—which at that time he attributed chiefly to 'atmospheric germs'—had already occurred before the patient came under the care of the surgeon; and (2) Those made by the surgeon thru previously unbroken skin."

"It does not concern us here to follow up the subsequent development of Lister's methods; the point is that he began his work with compound fractures and that he did something to these fractures which produced very remarkable improvement in the results, an improvement so self evident that no one could be in any doubt about it (very different in this respect from the results of brine and vaccine therapy), and which completely revolutionized surgical work."

"Now what Lister tried to accomplish was to kill the bacteria which had entered these wounds before they had had time to develop and take root in the body; and the substance which he chose for his first experiments was a fluid, chemically impure, but which contained a large proportion of carbolic acid and cresol. This he applied to the wound undiluted, and he used it in no niggardly manner, for not only was the impure acid applied all over the wound but the contused mass was repeatedly squeezed to induce the liquid to insinuate itself into all its interstices. He did not find that this acid caused sloughing of the surface of the wound, or led to extension of the septic processes, or that the blood clot which formed plugged the wound and permitted the development of the bacteria in the tissues; in fact he found none of the horrible things which we are told by our colleagues in France happened in the infected wounds when strong antiseptics are applied. Had this been the case, had Lister found that his applications made matters worse instead of better, he would have dropped the experiments at once, and the revolution in surgery would not have taken place. Is it conceivable that, if antiseptics were so injurious and ineffective, that most remarkable pilgrimage of surgeons from all the ends of the earth to Glasgow and Edinburg would have occurred and gone on for years? And Lister showed to those visitors all his cases, and among them there were always cases of accidental wounds and compound fractures which were following in an aseptic course."

"It is very remarkable that in the face of these facts some bacteriologists calmly dismiss the subject of disinfection of wounds and state that antisep-

Plate III.

"Wounds of the Face by a Bomb from a Trench Mortar." From No. 10 Casualty Clearing Station. Under the care of Lieut. Hilton, British Journal of Surgery, July 1916, 59.

tics are absolutely useless, but that they are not employed in such a manner that useful results could be expected. Sir Almroth Wright suggests that favorable results occasionally (?) manifesting themselves after antiseptic treatment might well be interpreted in the sense here suggested: i. e., as lymphagogues, mechanically clearing out the discharge, causing temporary hyperaemia, keeping the wound moist, and so on. Such a statement which is wrong in its premises, does not need any refutation by me."

"This being the answer to the question as to what it was that Lister did that revolutionized surgery, one would have thought that on the outbreak of war, the first impulse would have been to try to reproduce Lister's results. Unfortunately, of late years a most unaccountable prejudice has arisen against antiseptics, with the result that students have not been educated in their use: indeed they have been taught to decry their value, and to look on them as old fashioned and very objectionable substances. Hence, when the war began, they and also their teachers were unprepared; and when it became evident that their usual methods, sterilized dressings, salt solution, etc., were quite ineffective and that it might be worth while to turn to antiseptics, they had no clear ideas as to what to do, and consequently their efforts were unsuccessful. And the bacteriologists, not having any practical experience, have accepted such results as definite, and it does not seem to have occurred to them that perhaps those who had more experience of antiseptics might have done better."

New Factors in Treatment of Wounds.

Cheyne represents the attitude of those surgeons who would have us return to Listerism in its original form, or in something approaching that form. This attitude I believe to be absolutely wrong, altho I have the greatest respect and admiration for the glorious work done by Lord Lister in revolutionizing the treatment of infected wounds. We certainly have passed to a stage of understanding of infection which should lead us to a much more rational treatment. An exposition of this form of treatment will be found in an article by another equally prominent Englishman, who recently visited the United States, namely, Sir Berkeley Moynihan, delivered before the (1917) meeting of the Clinical Congress of Surgeons (Surgery, Gynecology and Obstetrics, December, 1917).

Moynihan, like Cheyne and in fact all others who want to thoroly understand the treatment of wounds, begins by a careful restudy of the teaching of Lister. I think that each of us can put it down as a fundamental principle of study that in order to thoroly understand the modern treatment of wounds we must begin by thoroly understanding the bacteriological factors and the antiseptic treatment of Lister. I take the liberty of quoting what Moynihan says about the relation of Listerism to the modern treatment of wounds:

"It is interesting to read again the works of Lister and to see how helpless he felt himself in dealing with putrefactive processes once firmly established in wounds. Lister everywhere distinguishes between the 'prophylactic' uses of antiseptics. All the marvelous achievements of modern surgery are due to the adoption by surgeons the whole world over, of the principle of the prevention of infection in wounds about to be made as distinguished from that of the subduing of an infection already rampant."

"Lister writes: The original idea of the antiseptic system was the exclusion of all microbes from wounds. 'Again, during the operation to avoid the introduction into the wound of material capable of inducing septic changes in it, and secondly to dress the wound in such a manner as to prevent the subsequent entrance of septic mischief!' Again, 'In wounds already septic attempts are made with more or less success to restore the aseptic state. Again, in speaking of the antiseptic system of treatment, I refer to the systematic employment of some antiseptic substance so as entirely to prevent the occurrence of putrefaction in the part concerned, as distinguished from the mere use of such an agent as a dressing."

"This distinction between the preventive and the curative use of antiseptics is in many respects that existing on the one hand between the power of a germicide as determined by experiments in vitro, and on the other hand, its capacity

to destroy organisms when it is introduced among the living and the dead tissues of a wound. In the former there is a direct conflict, a clean fight, between the microbe and the chemical agent. Few or none of the many intervening conditions are present which have to be considered when a bactericide is introduced in a wound cavity wherein there are a multitude of actions and reactions which even now seem very obscure and are often conflicting."

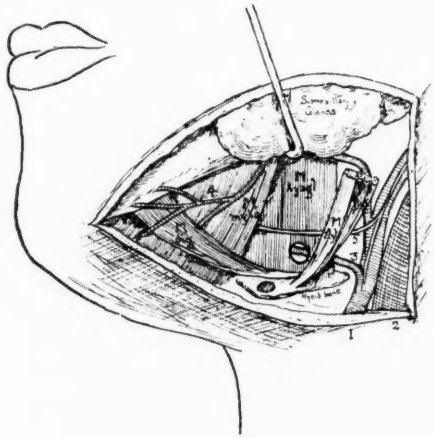
Moynihan goes on to explain:

"When after the lapse of many weeks from the outbreak of the war, there came a full appreciation of the several circumstances which had to be allowed on all hands that a new and grave problem had arisen which cried urgently for solution. What then were the several new factors that had to be considered?"

In this connection it is interesting to quote what Moynihan says about the bacteriology of wounds in France. The war has brought an entirely new element into the question of the treatment of wounds. France is a very fertile and highly agricultural country in the northern part where the battles have been fought. It is a country which is kept fertile by the use of large amounts of natural fertilizer. This fact coupled with the description of Sir Douglas Haig of the fighting in winter in the war zone, in which he says that the fighting is done in a "wilderness of mud," lays the foundation for the following paragraph from Moynihan's most important and interesting treatment of this subject:

"The bacteria infesting the wounds in France have been studied by Wright, Fleming and others. The general conclusion drawn from their work is that the micro-organisms, as might be expected, are those found in highly manured soil; they are, that is to say, of faecal origin. Wright suggests with his customary fecundity of invention, the new names 'serophytes' for those organisms which

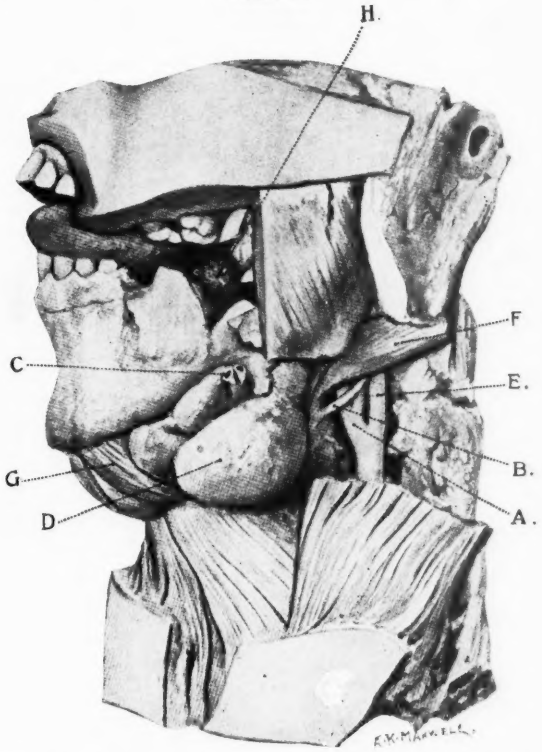
Figure 12.



"Diagram showing anatomy of the lingual artery. The submaxillary gland has been drawn over the side of the jaw with a hook. (1) External carotid artery; (2) Jugular vein; (3) Lingual artery (shown also in window in hyoglossus); (4) Submental branch of facial artery; (5) Hypoglossal nerve; M. dig. Anterior belly of digastric muscle; M. styl. Stylohyoid muscle; M. Myho, Mylohyoid muscle; M. hyogl. Hyoglossus muscle; P. dig. Posterior belly of digastric muscle." From, "The treatment of hemorrhage caused by gunshot wounds of the face and jaw." By Major V. H. Kazanjian, Harvard Surgical Unit, and Captain Harold Burrows R. A. M. C. (T. F.) British Journal of Surgery, July, 1917, p. 140.

will grow in normal serum, streptococci and staphylococci; and 'serosaprophytes' for those which can only grow in digested albumens. The native albumens of human serum are 'protected' from bacterial development at their expense, and of tetanus, enterococcus, a streptococcus of intestinal origin described by the French, the bacillus coli, and putrefactive bacilli X and Y which are the cause of the foul odor often met with in wounds. There is often a 'wisp' bacillus

Figure 13.



"Drawing from dissection of a case of bilateral fracture of the mandible due to gunshot wound. The illustration shows the dropping of the anterior portion of the mandible, and the manner in which the glands overlap the submaxillary triangle and render it difficult to expose the second part of the lingual artery. (A) External carotid; (B) Hypoglossal nerve; (c) Facial artery and veins; (D) Submaxillary salivary gland; (E) Internal carotid; (F) Posterior belly of digastric muscle; (G) Anterior belly of digastric; (H) Clot protruding from the exit wound in tongue." From "The treatment of hemorrhage caused by gunshot wounds of the face and jaw." By Major V. H. Kazanjian, Harvard Surgical Unit, and Captain Harold Burrows R. A. M. C. (T. F.) British Journal of Surgery, July, 1917, p. 141.

Wright points out that, if this were not so, human life would have been impossible. Among the serosaprophytes are the larger number of the organisms found in wounds, including all the anaerobes; the bacillus of Welch, the bacillus and a diphtheroid bacillus appears in later stages of the infection."

"All these micro-organisms find a most fertile medium for their growth in wounds of the character I have described. In every infected wound, where

the recesses are many and intricate, blood or serum may be poured out; tryptic digestion begins as a consequence of the destruction of the leucocytes, peptones are formed and bacteria finding everything to their liking grow apace. From many of the wound surfaces the circulation has been cut off by the powerful stunning effect of the blow given by the projectile and gangrene and sloughing make haste to develop. During the first 4 to 6 or in some cases even 8 hours few organisms or none can be recovered from the wounds, either by smear methods or by cultural methods. The organisms are there nevertheless, and given the prodigal fertility of the soil in which they are sown, will quickly show the evidence of the growth. In this brief early period the wound is said to be 'contaminated,' in all later periods 'infected.'

"Against this attack made upon it by immeasurable millions of organisms, how does the body protect itself? The chief defense is the blood serum and in the leucocytes (phagocytes). The capacity of these two, if only they have an adequate chance, may be said to be almost illimitable against all organisms but the streptococcus. The serum possesses strong bactericidal powers of its own; the phagocytes can devour bacteria greedily. But in exerting their powers, both serum and white cells are apt to undergo degeneration. The leucocyte breaks down and its power of tryptic digestion is then exerted upon the fluids around it, and peptones are produced in quantities which make easy the growth in them of all forms of bacteria. Moreover, the surface of the wound soon becomes 'lymph-bound.' A mesh of fibrin entangles the blood cells and a sort of matting of coagulated lymph spreads over all the surface. No fresh serum can then reach the wound, nor are fresh leucocytes available for the attack. The infective process can then proceed apace, unhindered by those powerful natural defenses which for the moment have quite broken down."

Plans of Treatment of Wounds.

In the main there are two widely divergent theories of the treatment of war wounds. The first may be called the German plan of treatment and has been well described before this class by Dr. Richter, who served for several months, previous to the declaration of war by the United States, in charge of a base hospital in Germany. In a word this plan is known as the wide open treatment of wounds; that is to say the wounds are left wide open for drainage and made to granulate in the bottom. This is a plan of treatment which we heard a great deal about a few years ago and which has many things to recommend it. In connection with this plan the Germans have made use of the bath treatment of wounds; patients are kept for hours or even for days in a continuous bath of flowing water and the wound freely exposed in all parts. I do not understand that the Germans make a great deal of effort at secondary closure altho secondary closure is used. They depend more on subsequent plastic work.

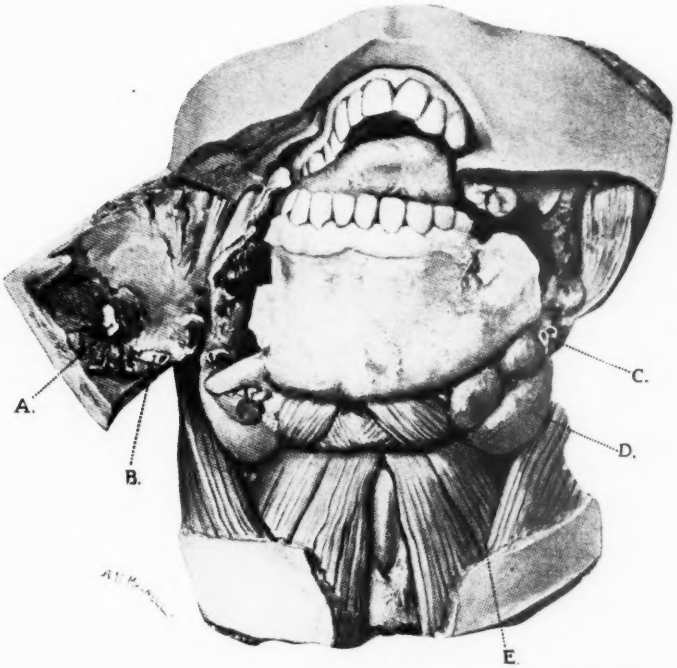
The literature shows that treatment of wounds falls largely under three heads. (1) The wide open treatment. (2) The primary closure. (3) The secondary closure. Incidentally of course the primary closure of contaminated wounds and the the secondary closure of infected wounds includes a preliminary treatment by antiseptics of some kind.

It is impossible to consider each one of the many excellent papers written in all languages on the use of antiseptics in the treatment of war wounds. As we have seen, Listerism underlies all the methods. What are called the physiological methods owe their origin to the work of Sir Almroth Wright; Wright has given especial attention to the bringing into use of all the antiseptic power of the tissue; in other words the ways and means of developing the natural defensive mechanisms of the body fluids and tissues to overcome infection.

Carrel and Dakin have been the leaders in developing the utility of the floating solution and take the first place in all literature when it comes to a consideration of such methods of treatment. They represent the class who are using chlorinated soda, boracic acid, chlorid of lime and other similar ingredients in solution in the treatment of wounds.

The third class among the users and advocates of antiseptics is led by Sir Rutherford Morrison who has done notable work in the use of bismuth, iodoform and paraffin paste in the treatment of wounds.

Figure 14.



"Anterior view of the dissection shown in Figure 13. Shows the characteristic jaw drop which follows bilateral fracture of the mandible. (A) Entry wound as seen from inner surface of reflected flap; (B) Facial artery completely divided in wound without causing secondary hemorrhage; (C) Left facial vessels; (D) Submaxillary gland; (E) Omohyoid." From "The treatment of Hemorrhage caused by gunshot wounds of the face and jaw." By Major V. H. Kazanjian, Harvard Surgical Unit, and Captain Harold Burrows R. A. M. C. (T. F.) British Journal of Surgery, July, 1917, p. 142.

These three general groups of workers base their claims for success on the same general principles. Wright uses a method to increase the antiseptic power of the tissues themselves, Carrel-Dakin use a solution put into the tissues by which the wound is kept bathed constantly and Morrison applies a paste over the tissues. All may be called antiseptic methods. With Moynihan we may reasonably ask ourselves, "What is it we expect an antiseptic to do in an infected wound?" The answer cannot be simply that we expect the antiseptic to discharge the bacteria which have found their lodgement in the wound. There are a great many other questions which must be taken into consideration:

"The problem of the action of an antiseptic in an infected wound is far too complex for a simple and ready answer."

Moynihan shows the complexity of the answer when he says:

"It may have an affinity for the tissues forming the wall of the wound, for the serum or for the leucocytes or for the raw track into the cavity of the wound or with the dressings applied to the surface. It may have a closing effect on different parts of the wound; it may for example, increase proteolytic digestion in cells. Therefore their effect is confined chiefly to the bacteria which are lying on the surfaces in the open wound. These facts must be taken seriously into consideration in judging the antiseptic power of any antiseptic or any group of antiseptics suggested for the treatment of wounds. And in fact all of the advocates of the different methods, do take these conditions into consideration."

Figure 15.

"Arterio-venus Aneurism of the External Carotid Artery." From "On the Vascular Lesions Produced by Gunshot Injuries and their Results." By Surgeon-General Sir George H. Makins, K. C. M. G., C. B., Consulting Surgeon to the Forces. British Journal of Surgery, January, 1916, p. 383.

its action upon sloughs and it may inhibit or prevent this process by its effect upon leucocytes and their immigration. The fact is that the action of antiseptics on bacteria as shown in laboratory tests, may be quite different in all the tissues. All of the conditions found in living tissues cannot be duplicated in the laboratory. The great difficulty with all antiseptics has been found to be their penetrative power. Few antiseptics, if any, have sufficient penetrative power to be of extended value without the power of destroying or at least injuring tissue

TISSUE INJURY, IMMEDIATE AND REMOTE, BY GUNSHOT WOUNDS.

"In studying the literature of the modern treatment of wounds, we will refer again to the article entitled "Investigation of the histology of the tissues immediate and remote from the point of injury in gunshot wounds of the liver, spleen, kidney, intestines, blood vessels, subcutaneous tissues, and aponeuroses," by Capt. E. F. Bashford, R. A. M. C.

(British Journal of Surgery, January, 1917). The author opens his article by declaring:

"It appears that the time has come when some generalization on the special characteristics of gunshot wounds should be considered in the light of the more extensive experience now available. For this purpose wounds complicated by the super-addition of inflictive processes must be discarded but a direct knowledge of the extent and nature of the injuries produced by the passage of the missiles is an essential preliminary to the investigation of bacterial invasion."

In considering the direct effect which the bullet or other missile has in traveling thru the tissues the author makes the following observation:

"It still remains to be proved, however, how far the actual velocity with which the bullet traverses the body effects the tissues beyond the actual area of the wound track; and clinical observation does not support the view that extensive injury, of the explosive-exit form occurs independently of the bullet meeting with such resistance as is offered by the bone—when the separated fragments, themselves endowed with motion, are responsible for the extensive laceration or of an irregular impact of the bullet with the surface, and consequent rotation. In support of this view, evidence may be adduced from the large cavities produced in the interior of the limbs by fragments of shells which in traversing the limb, have made but small aperature of entry and exit, or may even have been retained. Here a mechanism comparable to the spin of a cricket or golf ball explains the extent of the tissue damage more really than any theory of expansion in the limb or air compressed by the passage of the missile."

We will only devote attention to what the author says about injuries to blood vessels, subcutaneous tissues and aponeuroses. Regarding injuries to blood vessels the author says:

"The injuries of vessels have been studied in a number of cases, more particularly by following the disturbance of the elastic lamina. They may be illustrated by a case which was not investigated in the first place for this purpose, but to elucidate the way in which an open passage was made and were therefore not studied with a view to ascertaining whether there was only one injury, and preoccupation with other aspects led to the tacit assumption that there appeared to be also injury at a distance in accordance with a widely held view. A bullet had passed between the femoral artery and femoral vein, injuring their contiguous walls, so that a true aneurismal varix had formed, without an intervening sac. When the injured portions of the vessels were removed five days later, by Capt. Fraser, the torn walls of the two vessels were so united as to adhere on one-half of the circumference of the passage between them. This union was effected in part by the displaced adventitia of the artery. The attention given to the nature of this intervening piece led to the tacit track of the missile from a remote second injury to the vein wall. Re-examination of the sections mounted in series has shown that this appearance is due merely to the irregularities of a single transverse wound in the vein wall, from which there extended an irregular fissure for about three quarters of an inch in its long axis.

The limited nature of the disturbance is sufficiently shown by the arrangement of the elastic membranes and fibres in the accompanying diagram."

What the author says about the subcutaneous tissue and the aponeurosis in wounds and especially in those made by missiles of high velocity is as interesting and important in injuries of the face and jaws as of any other part of the body.

"The effects of injury on the elastic fibres has been studied in the subcutaneous tissue, and here also the disturbance is limited to an area immediately surrounding the track of the missiles. The capillaries in such an area are found, as in the accompanying figure (9) to be perfectly capable of well-known congestion so essential to and characteristic of early inflammatory change. In the case illustrated in Figure 9 they were not only dilated but were crowded with leucocytes, showing that far from being greatly injured, they were capable of supplying the requirements of inflammation right down to the injured surfaces."

"Five days after wounding, an examination was made of the aponeurosis covering the origin of the deltoid muscle, thru which a bullet had passed so as to destroy the head of the humerus and pass out behind. The great cellularity of the dense connective tissue around

the track, and the occurrence of columns of cells, were most striking, as was also the proliferation of new capillaries and of the sarcolemma nuclei of the muscle insertions. There could be no question of a zone of dead tissue surrounding the track of this missile of high velocity."

The effect of the passage of a metal on muscular tissue is still more striking and is illustrated by the author in several pictures. Regarding muscles the author says:

Figure 16.

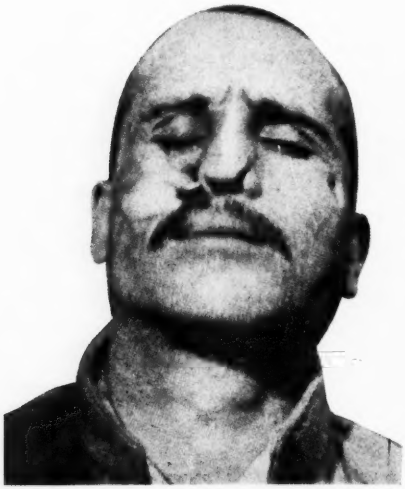


Figure 17.

"Wound of the Face by a Rifle Bullet." From "Illustrations of War Surgery," by the Editorial Staff, British Journal of Surgery, January, 1916, p. 505.

"The examination of injured muscle has been a daily occupation for eight months but it is only proposed to consider here whether the injury is localized to the track of the missile, or has also remote and important consequence. The conditions found have been so constant, that they are sufficiently illustrated by two examples representing the early and the late changes respectively. Figure 10 illustrates the appearance of a piece of muscle which lay immediately subjacent to the dense connective tissue seen in Figure 9, thru which shrapnel has passed and fractured the tibia, in which it was imbedded. A narrow zone of muscle fibres lining the track is dead and disintegrated. The sarcolemma neclei are nowhere stained by haematoxylin. The dead are sharply defined from the living muscle fibres, the latter presenting only an unusual appearance in places where excessive numbers of sarcolemma nuclei are apparent in the fibres nearest the track. The sharp distinction seen under the microscope was not evident to the naked eye of either the surgeon or the pathologist; but the surgeon had succeeded in his effort to remove the injured part by cutting into sound muscle, even if the margin appears slight as the subsequent course of the wound showed."

In Figure 11 the appearances in the muscle fibres adjacent to those killed by the missile, are shown under higher magnification. Two fibres are shown in which the proliferation of the nuclei of the sarcolemma has preceeded to the formation of almost solid tubes of cells.

Another illustration in this article shows the track of a missile thru the muscles of the lumbar region; which might almost have been made by a trochar. Another shows a section from the

same case under higher magnification "from which it is seen that only a narrow marginal zone of the muscle fibres has been called upon to take part in the processes of repair; the injury might be no less had it been produced by a sharp knife."

"Long muscles have been cut in continuous sections from the wound track to their insertion of origin, at distances of six inches and ten inches in two extreme cases; but no remote primary consequences have been discovered, nor have any late effects such as necrotic changes, fractures of muscle bundles, or hemorrhages at a distance been observed. The extent of the injury to long muscle is to be measured not by a line vertical to the axis of the track of the missile, but by the extensive surface area comprised in it or produced by the loss of tissue."

"In the case of some injuries to the muscles hemorrhage has been observed in the septa, but it only occurred in those nearest the wound; not more than half to three-quarters of an inch away."

"The secondary consequences of anaemia of muscles, due to the severance of vessels or thrombosis, have commonly been observed but they do not come into the category of the special characteristics of gunshot wounds; they will be referred to in a paper on the bacterial invasion of gunshot injuries of muscles."

"Altho the obvious local effects of gunshot wounds may sometimes be surprisingly extensive in their ragged ramifications, the foregoing observations show that remote and other far reaching effects are by no means universal. Indeed during eight months of close attention to so important a subject I have failed to find any evidence that they occur at all in the organs or tissues examined. If vibration be set up by the projectile in the tissues of the body it does not result in capillary hemorrhages, except in situations where they would be expected; for example, under the capsule of the kidney and remarkable disintegrations of cells or even injury of any sort at a considerable distance from the obvious site of the injury have not been met with. The heavy infection of tissues by bacteria, effected by the passage of projectiles, would of itself serve to shake any belief in vibration being an efficient cause of cell death, apart from the influence of direct violence. The bacterial invasion of injured tissues will be considered in another paper: here it suffices to point out that the facts set out above are all in favor of conservative surgery in gunshot injuries. By a too extended removal of tissues adjacent to the injury, the gap which has to be filled may often be made needlessly great, and the duration of the period of recovery needlessly increased, leaving out of all consideration other possible contingencies."

These statements are illustrated by figures 9, 10 and 11, in which the effect of the passage of the missiles on the adjacent tissues is clearly shown.

Tissue Fragments in Relation to Wound Infection.

That the problem of the treatment of gunshot wounds is not entirely one of the choice of antiseptics is further shown by the experiments of Kenneth Taylor, director of the Robert Walton Roelet Research Fund and pathologist to the Hospital Complementaire V. R. 76, Ris-Prambges (S. & O.) France. His article which is one of several on similar lines of investigation is entitled "Tissue Fragments and Wound Infection." I consider his work of fundamental importance. (Annals of Surgery, Dec., 1916). He states the proposition of the wounds of war as follows:

"In the course of injury by the missile utilized in the present war, a wound may be left containing several kinds of foreign bodies. There may remain, first, the missile itself; second, fragments of clothing; thirdly, detached or severely traumatized tissue fragments. Such danger as there may be from the presence of the missile itself depends on its position, its shape and size and especially its sharp edges, for on this depends the local tissue erosion which may result in serious hemorrhage or other damage to the structures in the immediate neighborhood of the missile. On its size and irregularities depends also to a large extent the number of bacteria with which it is charged and from which a focus of infection may arise. The danger from the shreds and fragments of clothing distributed along the track of the missile depends only on the load of bacteria which they contain. The danger from the fragments of detached tissue in the wound lies in the ready made medium of bacterial growth which they constitute.

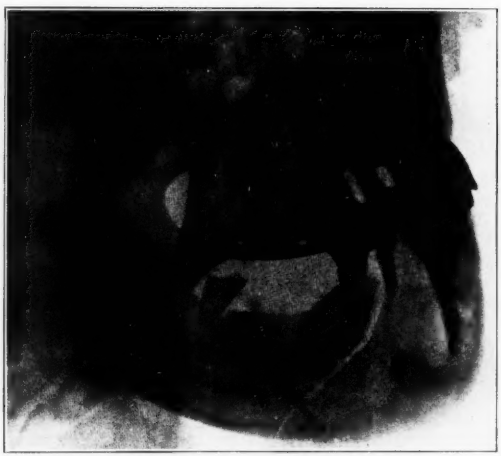
Thus the injury has usually supplied two factors favoring infection; the supply of devitalized tissue for culture medium and the inoculation with bacteria."

This investigator gives in detail the experiments on animals by which he shows conclusively that while the necessity of removing foreign bodies from wounds and establishing free drainage has long been recognized, little attention has been given to the devitalized fragments of soft tissue "which is a hot bed for the unlimited incubation and multiplication of the bacteria." To prove this he produced in animals identical conditions to those found in the wounds of war and in some he allowed the devitalized fragments of soft tissue to remain in contact with a definite quantity of infecting germs while in control animals similar wounds were made and the same quantity of infecting germs were used but all fragments of devitalized tissue were carefully removed. The difference in the reaction of infection in the two is striking. I quote Dr. Taylor's summary and conclusion as follows:

1. "The implantation of a sterile foreign body or a small piece of sterile dead muscle alone produced no microscopic lesions."

2. "The implantation of a foreign body infected with tetanus bacilli, staphylococcus aureus, B. Aerogenes capsulates, or streptococci produced usually a localized abscess formation without invading the surrounding normal tissue."

Figure 18.



"From a skiagram Showing Cap Splint in Place." From "The Prevention Deformity Following Fracture and Resection of the Jaw." By W. H. Dolamore, London, British Journal of Surgery, January, 1916, p. 532.

3. "The addition of a small portion of dead muscle tissue in the region of the infection produced a more rapid and diffuse inflammatory process with earlier and more extensive abscess formation than the wounds containing bacteria or those containing infected cloth."

4. "The implantation of infected cloth together with muscle tissue produced a more active and destructive lesion than the implantation of either alone. When infected with tetanus bacilli the presence of dead muscle fragments determined a high mortality."

5. "Of the two substances, cloth and devitalized muscle in the presence of infection, the muscle produced the more acute infective process."

"Conclusion—The result of these experiments suggests that in the cleaning of fresh wounds at least as much care should be exercised to remove separated and devitalized fragments of soft tissue as is taken to remove other foreign bodies."

"In all operative procedures where blunt dissection is practiced it should be remembered that torn fragments of devitalized tissue may remain to become a ready soil for the incubation of any bacteria which may gain access to the wound."

Figure 19.

"Skiagram showing a badly united Fracture which should have been treated by a cap splint. The union was fibrous." From "The Prevention of Deformity Following Fracture or Resection of the Jaw." By W. H. Dolamore, London, British Journal of Surgery, January, 1916, p. 534.

These experiments and their results furnish the pathological and bacteriological explanation of the good results achieved by the Wright, Dakin, Carrel method of thoroly opening up the wound, removing all foreign material including devitalized soft tissue and establishing continuous, multiple deep irrigation with an alkaline antiseptic solution until it is sterile and then closing it and securing union by first intention.

IRRIGATING SOLUTIONS.

Several solutions have been suggested for this purpose; all are similar and it may be that the ideal one has not yet been developed but all have several points in common.

The solution originally proposed by Dakin was as follows:

Rx.—
Sodium Carbonate, 140 grams.
Tap water, 10 liters.
Mix until dissolved and add Chloride of lime, 200 grams.
Boracic acid, 40 grams.
Mix. Sig. use Ad. lib. in wounds for cleansing irrigation or compresses.

Dakins solution as now prepared is as follows:

Rx.—Chlorid of lime (Bleaching powder) (20% active chlorin), 200 grams.
Tap water, 5 liters.
Mix and shake vigorously for a few minutes and leave in contact for 6 to 12 hours (over night for example) (shake until dissolved. Not all the pieces will

dissolve, large pieces float, notice only floating pieces.)

Rx.—

Sodium Carbonate, dry (soda of Solway), 100 grams.

Sodium Bicarbonate, 80 grams.

Ordinary cold water, 5 liters.

Mix and leave for 6 to 12 hours and then pour into the flask containing the chloride of lime solution and shake vigorously for a few minutes and leave for half an hour to allow the calcium carbonate to be precipitated. Then siphon off the liquid and filter it thru a double paper to obtain a clear liquid. (The liquid should be kept in a dark place.) Never heat the solution.

This solution is similar to Labarraque's solution and to Eau de Javel and a large number of combinations have been developed by different investigators in an effort to overcome several objections to Dakin's solution. Some of these difficulties are that it does not keep well especially if exposed to the light and is likely to become caustic. If it is over 50% hypochlorite it will be too caustic and if below 46% it will be too weak. Another serious objection is the complicated formula by which it is made. Prof. J. Lorrain Smith and his associates have developed a solution called Eusol which is much simpler to make and keeps quite as well, and some think is fully as efficient as the solution of Dakin.

Eusol is made as follows:

Rx.—

Boracic acid.

Chlorid of lime, aa gms. XII ss.

Water, Liter I.

Mix and shake until disolved and it is ready for use.

While Dakin has devoted himself to the developing of various solutions, Carrel has been occupied with the examination of all solutions suggested and especially in devising methods for their application.

Thus the Dakin-Carrel technic in the treatment of wounds means the use of Dakin's or some similar solution by the Carrel method. This method consists of multiple rubber tubes introduced into the deepest part of the wound and a continuous irrigation with the solution until it is rendered sterile and can be closed by suture and will heal by first intention as tho there had been no infection. This work marks a remarkable advance in the handling of wounds which none of us can afford to overlook. My own use of it has been confined to only a few cases (probably about 25) but the results have been all that is claimed. A 1 to 2,000 sodium hypochlorite solution is quite as efficient an antiseptic as 1 to 100 solution of carbolic acid. This is the test of efficiency used for all these new solutions.

"Tuffier states that 80% of all amputations are due to infection (or the fear of infection) and only 20% are due to destruction of tissue by the injury. If Dakins solution used by the Carrel method will prevent or cure the infection in this 20%, just so many limbs will be saved from amputation (and the same proportionate improvement will follow in other parts of the body.) We all know the ravages of infection and can appreciate the boon to humanity from a method which will readily and completely overcome infection or prevent it. The vast majority of deaths, amputations, disabilities and complications are due to infection; therefore we must control infection."

The antiseptics used in the past have been either too weak and feeble in germicidal action or have been too irritating and either actually destroyed tissue or at least so reduced resistence as to actually favor infection rather than overcome it. While there has been much opposition in some quarters I am glad to read a statement by Joseph Rilus Eastman, in Surgery, Gynecology and Obstetrics, January, 1917, that the method was employed with modification in the Base Hospital in Vienna in which he served. The time is at hand when the medical profession may be held responsible for their failure to accept a scientific advance that means the saving of an enormous number of cripples and of lives. It is

claimed that of the wounds treated at Compiegne by the Carrel method 99% have united by first intention, with practically no reaction either along the line of incision or at the stitches.

In considering the literature of war wounds a few words should be said recommending two recent books; one by W. W. Keene, of Philadelphia, entitled "Treatment of War Wounds," and the other by Carrel and Dehelly entitled "Infected Wounds."

Figure 20.

"The same case as Figure 19, showing the Deformity where the bones fell together." From "The Prevention of Deformity Following Fracture or Resection of the Jaw." By W. H. Dolamore, London, British Journal of Surgery, January, 1916, p. 535.

Both of these are handy volumes and can be easily carried. They contain the jist of the most recent knowledge on the subject. Of course the books by Carrel is directly in line with the present study. While we may not agree with all which Carrel says about the treatment of wounds and may even disagree with the results claimed, or believe that the same or better results can be obtained by other methods, we must give Carrel and his associates credit for the highly scientific way in which they have studied the subject. Certainly no other investigator has brought into it so much orderly study and so much development of technic of wound treatment. For this reason we are justified in devoting considerable time to its literature. I wish to call your attention to certain chapters in Carrel's book. He illustrates all of the apparatus used and perhaps proves to the satisfaction of the critics at least, that the greatest objection to his method is the amount of apparatus which is necessary for its successful application. The apparatus consists of rubber instillation tubes with many small perforations in them and of glass distributing tubes of various sizes and having from one to four branches and numerous Ys and Ts. There must be ampoules or flasks for holding the solution and pinch cocks for regulating the flow. In some instances the solution is instilled into the instillation tubes by a glass syringe with a rubber bulb. He illustrates the application of the tubes to the various conditions of the wound. He shows how the method is applied to a wound with horizontal recesses and demonstrates by a picture that the proper

method is to have the tubes next to the wound and the gauze on the outside of the tubes and not to have the gauze next to the wound and the tubes on the outside. He shows that it is an advantage to have a quantity of the solution in the wound which is cup like and to keep the wound filled with the solution. By many carefully selected illustrations he shows just how to make application to almost any kind of a wound whether it be deep or superficial; whether it has a single sinus or many sinuses and whether it requires one tube or many tubes. One of his pictures shows as many as eight instillation tubes in place in one wound in the extremity. All the solutions and tubes used are ingenious and interesting and should be thoroly understood by all those who wish to treat their wounds by this method. The most important part of the book consists of several charts which show, by careful bacteriological examination, that the number of bacteria are increased from day to day during the injury. He also shows copies of these microscopical fields and illustrates the rapid disappearance of the microorganisms from the field under the treatment. This of course is a fairly scientific method of demonstrating the value of a method of treatment. While none of the illustrations in this book are taken from the mouth or jaw I cannot see but in the main it would be as applicable at this region as at any other, excepting perhaps in those cases in which the wound is actually in the mouth, and a part of the solution would be swallowed. While the solution is not actually poisonous it would be very disagreeable to the patient and it would be undesirable to have very much of it swallowed. I could not do better than to urge each member to read this book carefully as an object lesson in the thoro scientific study of wounds even tho you do not care to adopt Carrel's method in detail.

Antiseptic Pastes.

As radically opposed to the Dakin-Carrel method we have the method proposed by Morrison, which has many points in common with Beck's treatment. Rutherford Morrison, of England, who is associated with Sir Berkeley Moynihan, has published several interesting articles on this subject. The last article appears in the April, 1917, number of the British Journal of Surgery. He is connected with a hospital where only suppurating wounds are received for treatment. Soldiers injured in France are sent to England and entered in this hospital and begin treatment from five to seven days after the injury is received. Morrison has developed a plan which is a modification of the Beck Paste. He calls it Bip. The word "Bip," if it can be called a word, represents the first letter of Bismuth, Iodoform and Paraffin and is made as follows:

Bismuth subnitrate or carbonate, one (1) part.

Iodoform, two (2) parts.

Paraffin g. s. to make a soft paste.

This is applied to the wound with a swab. I quote his plan as follows:

Under an anesthetic, usually open ether, cover the wound with gauze wrung out of 1-30 carbolic acid, and clean the skin and the surrounding areas with the same lotion."

2. "Open the wound freely and if possible sufficiently to permit of inspection of its cavity. In doing this special regard must be paid to nerve trunks and muscular branches of nerves, since the division of blood vessels, excepting the largest, and of muscles themselves does little harm as compared with that of the disability following nerve damage. Cleanse the cavity with dry sterile gauze mops, * * * and remove all foreign bodies."

3. "Mop the surrounding skin and the wound cavity with methylated spirit. Cotton wool mops conveying the spirit are used for this purpose, and are introduced on forceps."

4. "Fill up the whole wound with the paste described in the foot note. (Foot note—Bismuth iodoform paste 'Bip' is

made by Sergt. Hunter as follows: Iodoform, 16 oz.; Bismuth subnitrate, 8 oz.; liquid paraffin, 8 fl. oz.; or a sufficient quantity. The powders are mixed together in a mortar, and the liquid paraffin incorporated. The quantity of liquid paraffin required varies according to the bulk of the powders, the bismuth in particular being liable to a considerable variation in bulk. A sufficient quantity should be added to form a paste. It is then advisable to rub down the paste, in small quantities at a time, on a slab with a spatula, to ensure freedom from grit and dry particles of powder.)"

"Dress the wound with sterile gauze, and cover all with an absorbent pad which is held in position by sticking plaster and bandage. This dressing requires no change for days or weeks if the patient is free from pain and constitutional disturbance. Should, however, discharge come thru the stained part must be soaked in spirit, and a gauze dressing wrung out of the same applied as a further covering. Redressing is very simply done. After removal of the old dressing the wound is covered with a dossil of wool soaked in spirit, and the sticky dirty looking discharge is wiped off the surrounding skin until it is clean. This is done with dossils of cotton-wool soaked in spirit and applied by forceps."

This plan has many advantages over that of Carrel-Dakin. First, it requires no redressing or needs redressing at very long intervals. Second, there are no solutions to keep the bed soiled or the patient in a wet pool. Third, it is especially applicable where there are fractures and splints are nececssary. Morrison seems to have taken great care with his observations. His cases have been studied and his conclusions drawn, under the following heads: 1. Temperature. 2. Pulse-rate. 3. Emaciation. 4. Bronzing of the skin. 5. Diarrhoea. 6. Stomatitis; blue patches on the gums and on the mouth. 7. Nervous symptoms. 8. Urinary symptoms. 9. Excessive discharge from the wound.

General Treatment of Wounds—Recapitulation.

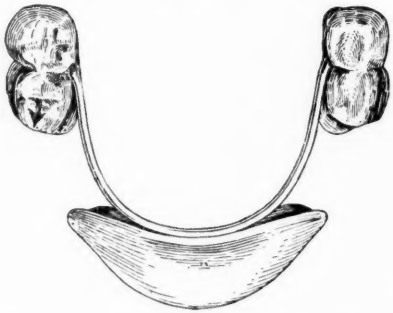
To recapituate for a moment regarding the treatment of wounds we have in the main two general propositions; First, aseptic wounds, those which are neither soiled nor infected. These we close by primary suture with the full assurance that union will take place by first intention. The laws for handling such wounds are so thoroly understood that they do not need discussion.

War wounds are those which have become soiled or infected. Cleansing of soiled wounds by some solution or paste or by some method which immediately removes the soiling micro-organisms enables the surgeon to close them by primary suture. Here the great care of the surgeon is the selection of wounds suitable for this treatment. In war at least, only a small number of wounds fall in this category, because of the time which necessarily elapses before they receive even first aid and the inherent difficulties of applying a first aid dressing which will overcome the microbic soiling. Therefore our main consideration must be for wounds which are first treated with some antiseptic and then closed by secondary suture.

My own opinion is that the ultimate method adopted in the treatment of wounds will not be either the Carrel-Dakin method or the Rutherford Morrison method but will be a method which will grow out of the careful treatment and bacteriological study made by these men and their co-workers. We have already referred, in one quotation, to the fact that when a missile enters, a certain area of tissue is devitalized. If that wound is treated by the antiseptic method or by the wide open method or by any other method it will be necessary for this devitalized tissue to be disposed of. Some of it will be disposed of by the active living tissues adjoining but the most of it will be disposed of by sloughing out of the wound. This is what we call having a wound "clean up." We frequently hear it said "the wound is cleaning up nicely." By this is meant this devitalized tissue is sloughing out. It has been shown that certain staining

agents can be used which will show at the time of the first dressing the limit of this devitalized tissue. In other words the active, living, healthy, normal tissue will not take up this stain but the injured and dead tissue will take up the stain. This marks the limit of such an injury to the tissue. There is still another and probably better method of marking the limit of such tissue and that is by direct examination by the surgeon. A little experience will show the eye and the sense of touch whether the tissues are

Figure 21.



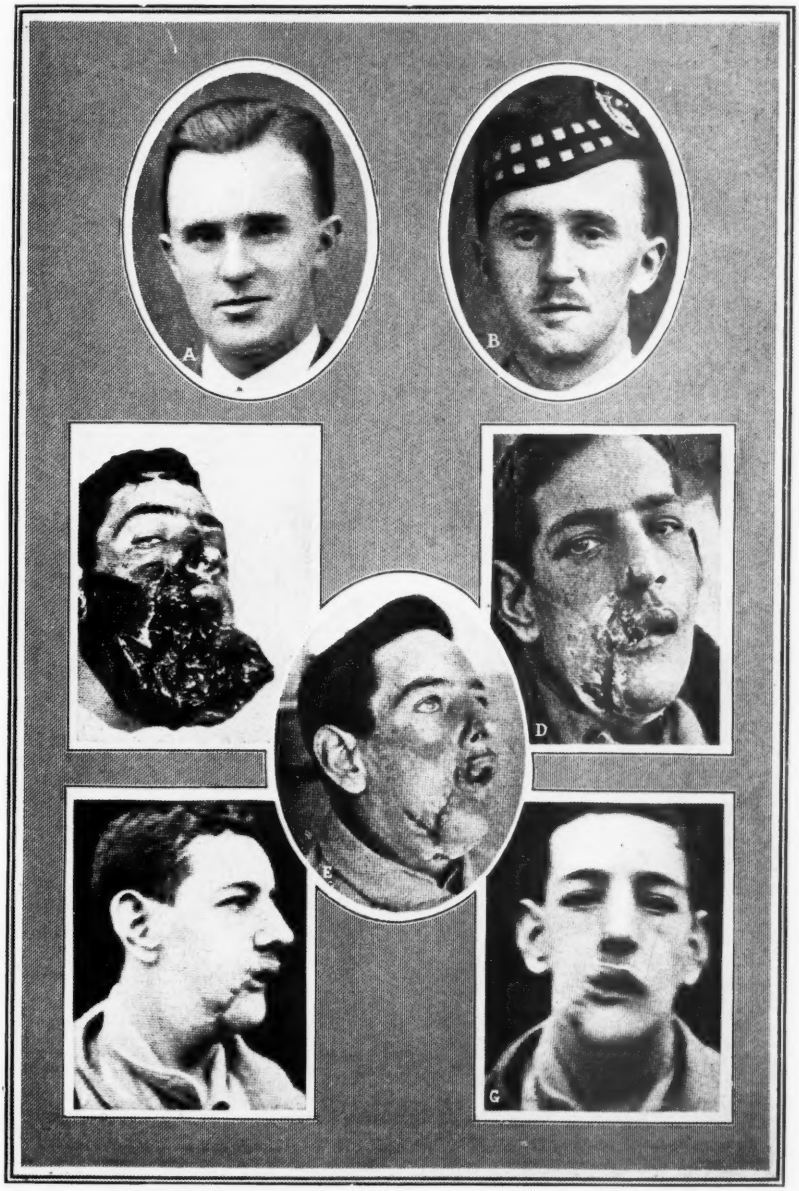
"Splint designed to Restore the Contour of a Destroyed Chin." From "The Prevention of Deformity Following Fracture or Resection of the Jaw." By W. H. Dolamore, London, British Journal of Surgery, Jan., 1916, p. 544.

healthy and strong and alive or whether they have been killed by the injury. We need not hesitate to carefully cut away all the tissue which has been injured and bring the tissues which are healthy together by suture. Thus we will get an immediate healing of our wound. I want to illustrate this by two very recent cases which for all practical purposes are war wounds. Both occurred in farmers, both were filled with the dirt of the field, both were soiled in a way that might lead to any kind of infection.

The first was a young man 25 years old who accidentally shot away the metatarsal bone of the second and third toes of his right foot. There was also a compound fracture of the matatarsal of the great toe and the metatarsal of the fourth toe and the phalanges of the second and third toes were left without any bony connection to the body of the foot. In other words he had a hole blown thru the foot. He entered the hospital perhaps six hours after the injury. He was given an anesthetic and all of the injured tissues were carefully cut away, including the second and third toes and every shred of injured tissue so far as could be searched out, whether it was bony tissue, muscle or tendon. This done, the two raw surfaces were brought snugly together by thru and thru sutures and the skin on both sides sutured with only small drains at the corners to guard against any possible error in the technic. This wound made a prompt primary union and the man has a useful and fairly shapely foot.

The second case is that of a young man who sustained a gunshot wound of the elbow joint by which all of the articulating surfaces were comminuted or carried away. The wound was very large and ragged. However, the princi-

Figure 22.



"A, represents Lieut. C. before the war; notice the protruding lower lip, and that having lost over an inch of lip and chin when wounded, this has not much interfered with his present appearance. B, shows Lieut. C as he is today. (Figures 23 to 26). C, shows Private H. as when first seen by me; D, was taken three weeks after his first operation, (performed five or six days after being wounded); E, Pte. H. eight weeks after; F, G, are two photographs taken four months after." From "A few Suggestions for the Treatment of Fractured Jaws." By Major A. C. Valadier, R. A. M. C. (T. H. C.) British Journal of Surgery, July, 1916, p. 66.

pal bloody supply was intact and the radial artery was in good condition. Therefore I decided to pursue the same method as was used in the previous case. All injured tissue was carefully cut away, all fragments of clothing, wading, etc., were removed. I extended the cleaning up process far enough to get every bit of tissue that did not look or feel like normal tissue. After this was done the wound was brought together and sutured, only a very small drainage tube being placed in one corner to cover any error which might have been made in technic. This wound, like the other, healed promptly and thruout in the most kindly manner. There was surprisingly little reaction and this man has a very good useful arm with a flail joint. I saw him a few days ago (about three months since his injury) and you would hardly recognize that he had had an injury until his coat was removed and attention was called to the arm. Of course the arm is somewhat shorter than the other,

Figure 23.

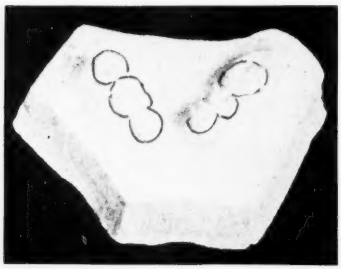


Figure 24.

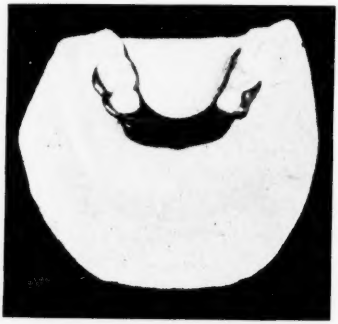


Figure 25.

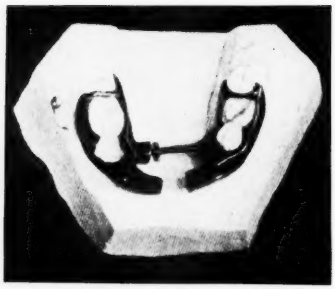
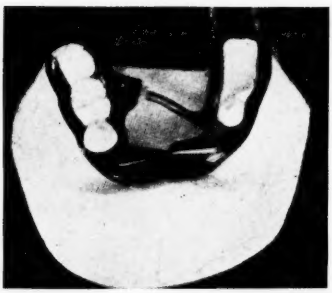


Figure 26.



Illustrate Lieut. C's treatment in detail. "two ends of the mandible were allowed to come together by wiring, and an impression was taken; an X-ray examination having shown that callus was forming. (Figure 23). A jack-screw was used to push apart showly the fractured ends, and after four weeks a retention appliance was inserted. (Figure 24). Three weeks later a larger jack-screw (Figure 25) was inserted, and this was followed by another, with pressure on a different point, (Figure 26), until I had obtained the result as shown. A retention appliance was then inserted to allow for strengthening of callus, which finally formed new bone. From "A few Suggestions for the Treatment of Fractured Jaws," by Major A. C. Valadier, R. A. M. C., (T. H. C.) British Journal of Surgery, July, 1916, pp. 67 and 68.

but is a useful arm with a very fair range of motion in its flail elbow joint. (Blackboard drawings were made by the author to illustrate the two cases.)

In summarizing the treatment of wounds, I cannot do better than quote what Sir Berkeley Moynihan said in his address on this subject as published in the December (1917) number of Surgery, Gynecology, and Obstetrics:

"Perfect mechanical cleansing—that is, the excision of all contaminated, infected, or dead parts—the removal of all fragments of cloth (by far the most important of all causes of confining infection in a wound) and of all projectiles, is the supreme necessity in all cases."

"In early cases this may allow of immediate closure of the wound which will be followed by healing in the great majority of cases, say in 80 per cent, or perhaps even 90 per cent, of those in which there is no loss of tissue."

"In infected early cases the mechanical exposure and cleansing may be followed by a treatment directed to the removal of the remaining infection. Physiological and antiseptic methods have each their advocates. The aim of both is to permit of the earliest prudent secondary closure of the wound. In "infected late" cases, a thoro mechanical exposure and cleansing of the wound and the parts around will allow of secondary closure forthwith if certain antiseptic pastes are used. Experience shows that similar results have followed upon this mechanical treatment of the wound without the introduction of antiseptics. A further trial in this class of cases may show that the natural defenses of the tissues are ample to deal with the infections then remaining."

"It is the natural defensive powers of the body fluids and tissues, of serum and leucocytes, that are the chief agents in finally subduing the bacterial infection in the wound. Sufficient reliance does not appear to be placed upon the stupendous power of the body tissues for controling infection."

"Finally full emphasis must be laid on the paramount necessity for the complete immobility of wound parts at all times and on all occasions. So will one of the most powerful agencies making for reinfection and auto-inoculation to be kept in check."

The recent literature of the treatment of wounds is so voluminous that it is impossible to do more than refer to a few of the leading articles. We have not exhausted even the best, but I hope enough has been presented to encourage further research.

LIST OF ARTICLES ON SURGERY OF THE FACE AND MOUTH.

Prepared by
Dr. Carl E. Black, Jacksonville, Illinois.

The list of articles, part of which will appear in the next issue of The Journal, is divided into thirty-five groups, each under a separate heading. These are all recent articles which have appeared in medical and dental journals. Many articles in French Journals, and a considerable number in Italian, Spanish, German, Norwegian and Russian, have been reviewed, but they are not included in this bibliography.

Each group of articles was assigned to a committee of the class, and brief extracts of the more interesting papers, were presented before the class.

NO. I—GENERAL SURGICAL CONSIDERATIONS OF THE WAR.

The Physician in War, G. M. Blech, Am. J. Clin., Med., 1917, XXIV, 415.

Some of the Lessons of the War. The New Way of National Life. J. Barr, Am. Med., 1917, 12, 433.

A Few Remarks on European War Surgery, A. O. Fasser, Internat. J. Surg., 1917, XXX, 187.

Behind the Lines of Verdun. Alonzo Milton Nodine. P 298, Dental Record, London, Eng., 1917.

War's Influence on Medicine (1917) C. H. Mayo, J. A. M. A., June 9, 1917, 1673.

Prognosis. P. H. Ringer. Virg. M. Semi-Month, 1917, XXII, 105.

Six Weeks' Study at the Val-de-Grace Military Hospital, Paris. E. Comte. P 424, 2 Illus. P. 492, 2 Illus. Dental Record, London, Eng., 1917.

The Replacement of Morphine in Surgical Practice; report of 110 cases. J. H. Schall, Long Island, M. J., 1917, XI, 187.

Preparedness. W. A. Chapman, Internat. J. Surg., 1917, XXX, 174.

Report on the Work done by the British Red Cross Dental Surgeons. Field Robinson. P 137. Brit. Den. Jnl., 1917.

The Wounded as We See Them at Home. W. C. Allardice, West M. News, 1917, IX, 73.

Flies and Field Surgery. E. O. Kane. Internat. J. Surg., 1917, XXX, 146.

A Short Account of the First Dental Operating Vans for Army Service at the Front. Parker-Cater. P. 41. Brit. Den. Jnl., 1917.

War Surgery at the Front. C. MacLaurin. Med. J. Austral, 1917. i. 503.

Hospital Francais de New York, Hospital No. 32 Bis Passey par Veron (Yonne) France. Alonzo Milton Nodine. P. 105. 2 Illus. Dominion Dental Journal, Toronto, 1917.

Gradual Development of Surgery. M. D. Delaney. Virg. M. Semi-Month, 1917, XXII, 59.

Factors which Contribute to Safety and Success in Surgical Procedures. J. C. Fleming, Indiana St. M. Ass., 1917, X, 269.

Medical Preparedness as a Factor in Great Drive for Democracy. J. C. Bloodgood. South M. J., 1917. X. 746.

War Surgery. T. H. Goodwin, Mil. Surg. 1917, XLI. 279. (62).

Surgery Next Door to the Front. T. B. Layton, Lancet, Lond., 1917. CXCIII. 483. (61).

Progress in Surgical Therapeusis. A. Vanderveer, Med. Rec., 1917. XCII, 495.

Surgery Before or After Constitutional Treatment in Tubercular Conditions. E. Bonime, Long Island, M. J., 1917. XI, 349.

Conservatism in Surgery. S. J. Mixter, Ann. Surg., Phila., 1917, LXVI, 257.

A Miracle of Surgery. Harold Begbie. P 84. Selected. Dental Post-Elevator Mandibular Fractures. Georges Villain. P 122, 16 Illus. Translated. Dental Record, London, Eng., 1918.

Observations in Military Surgery. W. A. Clark, Surg. Gynec. and Obst., 1917. XXV, 463.

What the European War Has Taught in the Treatment of Wounds. W. L. Brown, South M. J., 1917, X, 809. (III).

The Influence of the Present War on the Treatment of Infected Wounds. K. W. New, N. Orl M. & S. J., 1917, LXX, 20.

The Department of Oral Surgery of the Harvard Surgical Unit. Maj. V. H. Kasanjian. P. 454 Brit. Jnl. of Dental Science, 1917.

The Influence of War on Medical Science. J. Ewing, J. Am. M. Ass., 1917. LXIX, 249, 1917.

The Function of the Military Orthopedic Hospital. F. H. Albee. N. Y. M. J., 1917, CVI, 2.

A Summary of Medico-military Facts Developed by Experiences on European Battle Fronts. H. K. Loew, N. Y. M. J., 1917, CVI, 5.

NO. 2—MILITARY CLINICAL ORGANIZATION.

The Work of British Pathology in Relation to the War. F. W. Andrews. Brit. M. J., 1917, 1,829.

Duties of Medical Officers at the Front. J. W. Frew, Wis. M. J., 1917, XVI, 25. I. A. S., 1917.

The Collection and Evacution of Sick and Wounded from Front to Rear. T. H. Goodwin, Mil. Surgeon, 1917, XL, 609.

The Development of British Surgery in the Hospitals on the Lines of Communication in France G. H. Makins, Brit. M. J., 1916, 1789.

The Development of British Surgery at the Front. A Bowlby and C. Wallace. Brit. M. J., 1917. 1, 705.

Experience in a British Military Hospital. J. B. Dawson Med. J. Austral., 1917, 1, 479.

Organization of Base Hospital. H. B. Gessner, N. Orl. M. and S. J., 1917, LXIX 842.

A Day's Work. A. MacPhail. Lancet Lond., 1917, CXCII, 979.

Medical Units in the Field. O. L. Pothier. N. Orl. M. and S. J., 1917, LXIX, 825.

The Most Practical Plan for the Organization, Training and Utilization of the Medical Reserve Officers of the Reserves, in Peace and War. Med. Rec., 1917, XCI, 857.

Surgery in Field Hospital Service. R. M. Eaton. Am. Med., 1917, XII, 319.

Clinical Organization of Medical Profession. C. O. Hawthorne. Brit. M. G., 1917, 169.

Problem of Unnecessary Operations and of Incompetent Surgeons. A. D. Bevan, J. Am. M. Ass., 1917, IXIX, 161.

The Care of the Ambulatory Accident Case. H. G. Stetson, Boston M. & S. J., 1917. CLXXVI, 447. (503).

NO. 3—FIRST AID.

National Standards for First Aid. J. C. Bloodgood. Penn. M. J., 1917. XX, 666.

Safety First in the Operating Room. M. Horner. Trained Nurse and Hosp. Rev., 1917, p. 261.

Safety First and First Aid. C. W. Hopkins. Internat. J. Surg., 1917, XXX, 172.

Emergency Suggestions. J. A. Hofheimer. Internat. J. Surg., 1917, XXX, 157.

First Aid to the Injured as it Applies to the Railroads. R. W. Knox. South. M. J., 1917, X. 581.

First Aid to the Injured with Reference to American Red Cross. O. M. Marchmaun, South, M. J., 1917, X, 680.

First Aid and Dressing Stations in Battle in Austro-Hungarian Army. J. H. Ford, Mil. Surg., 1917, XLI, 179.

First Aid to War Wounded. W. W. Robinson. Maine Med. J., Jan., 1918.

NO. 4—SURGICAL TECHNIC.

The Treatment of the Wounded in the Present War. H. J. Paterson. Internat. J. Surg., 1917, XXX, 178.

Some Inconsistencies in Surgical Technique. J. S. Horsley. South. M. J., 1917, X, 423. (213).

A Portable Operating Table Attachment. T. Stellwagen, Jr., N. Y. M. J., 1917, CVI, 694.

The Suction Apparatus in Surgical Operations. W. M. Brickner, Am. J. Surg., 1917, XXXI, 117.

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A REVIEW OF THE RELATIVE AND ACTUAL EFFICIENCY OF MEDICAMENTS FOR THE STERILIZATION OF TOOTH STRUCTURES.

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THE purpose of this short paper is to review in brief the recent work accomplished on the efficiency of sterilizing agents for tooth structure, and thereby focus the attention of the profession upon those agents that have proven most valuable, and also to influence men to discard useless and inefficient agents. Never has the need for a standard method of sterilization of tooth structure been so apparent.

I will only place before you such information as seems to be supported by carefully conducted research, and will refer first to the work of Mayrhofer, Principien einer rationellen Therapie die Pulpagangrän and Klinisch-bacteriologische Untersuch zur Pathol u. Therapie d. faulen Zahnpulpa—Jene, 1909, Erganzungscheft, 1910. This work of Mayrhofer comprises several hundred pages and records his observations on the treatment of six hundred teeth. I mention it here for two reasons; namely, he found that notwithstanding the fact that he made these teeth sterile by the use of formo-cresol, that in from two to ten weeks thereafter, the canals of most of them were reinfected, and he recommended Balsam Peru as a root canal filling material. H's work does not, however, certainly determine whether the bacteria found in the canals after two to ten weeks were the result of re-infection or imperfect sterilization. He shows his best results with Peru balsam. H. Boenneken in 1913, "Oesten Zeitscher f. stomatol." records a series of observations on the relative value (for root sterilization) of thymol alcohol, chlorphenol, aqua regia, Formalin, tricres formal, sodium hydrate, potassium hydrate, phenol, chloral hydrate, Peru balsam, antiformin, and eugenol. Boenneken ranked as equal in efficiency, thymol alcohol, chlor-phenol, and aqua regia. His experiments led him to value the other drugs studied in the following order: tricresol formal, sodium hydrate, potassium hydrate, phenol, chloral hydrate, Peru balsam, antiformin, and he placed eugenol at the bottom of the list.

G. Blessing in the Monatschrift für Zahnheilkunde, 1914, page 763, also records a series of observations on the relative value of the following drugs as sterilizing agents for root canal work in gangrene of the pulp. Blessing places their value in the following order: Phobrol, Thymol alcohol, aqua regia, pulpa Kavol, antiformin, Tricresol formalin, Perugin. Both of these men differ from Mayrhofer in placing Peru balsam low in their scale of values. Both name drugs not commonly used in our country, and both agree that aqua regia and Thymol alcohol have a high sterilizing value and disagree with the latter work of

Dahlgren, who gives Thymol alcohol a low sterilizing value, and with Brooks and Price, who also give aqua regia a low sterilizing value.

In 1917, B. E. Dahlgren, who, for a short period came back to his alma mater as Associate Professor of Theory and Practice, College of Dentistry, University of Minnesota, published in The Journal of the National Dental Association, Volume four, Number one, and Volume four Number three, an original investigation on the relative efficiency of sterilizing agents for tooth canals of the following fifteen agents. He expresses their relative value in percentages in the following table, which was made after two applications of the agents studied on groups of teeth prepared for his experiment in the following manner:

"Three hundred freshly extracted teeth were selected from at least twice that number which had been dropped into normal saline solution immediately on extraction. They were cleaned as soon as possible and opened, the contents of the pulp-chamber and canals removed when present. Three hundred were as many as could conveniently be handled at one time. They were stopped with cotton and sterilized in the autoclave. Each tooth was then picked up with flamed tweezers and the root portion dipped in hot paraffin to above the gingival line, after which the teeth were imbedded up to the gingival line in bars of plaster, ten teeth to a bar. The teeth were thus isolated from the plaster in which they were set for convenience in handling. Two such bars, twenty teeth, were used for testing each disinfecting agent. Two bars were set aside for control. The plaster bars with the teeth were thruout the experiment kept at body temperature in an incubator which was converted into a moist-chamber.

Beginning then with sterilized teeth, all were infected alike with a culture in saliva of bacteria from putrescent canals, but first blood serum obtained by centrifuging rabbits' blood was introduced into the canals of each tooth by means of a fine pipette. The infection with this heavily bacteria-laden saliva was repeated after a week and saliva and broth were supplied to the canals several times and the incubation allowed to progress for about three weeks. It was considered that this treatment should render all infected alike and as thoroly infected as possible. Tests at the end of this time showed a very heavy infection with apparently all forms present which had been in the original culture. As far as could be judged from the examination of smears, there seemed to be no change even in the relative prevalence of recognizable forms.

The "Treatment" was then carried out much as usual with putrescent teeth using, of course, only single disinfecting substance for each set of twenty teeth. The canals were entered with broaches, a certain amount of mechanical cleaning was effected, the pulp-chamber and canals were flooded with the respective disinfecting agent and finally a dressing of the same substance on cotton fibres placed in each canal and the tooth stopped with sandarach and cotton. The teeth were then returned to the incubator for 48 hours after which the treatment was reported with more thoro cleaning of the canals with sterile broaches. Again the pulp-chamber and canals were flooded with the same agent, dressings placed and the teeth sealed and returned to the incubator for another 48 hours.

The canal dressings were then removed and teeth stoppered with sterile cotton pellets and once more returned to the incubator for 48 hours in order to give some time for the disappearance of the more persistent agents, such as creasote.

The tests for sterility were then performed. These were carried out on one-half of the teeth by placing in the canals under strict aseptic precautions, sterile canal points (obtained by cutting the tips of J. & J. canal points and resterilizing) which were soaked in broth, plugging the teeth again with sterile cotton pellets and returning them to the incubator. After 48 hours the points were removed with fine flamed tweezers or sterile broaches and dropped into broth. The other half of the teeth were tested more directly by taking from the canals small shavings with sterile flexible reamers or twist broaches. The samples thus obtained were then dropped or floated off into broth. In all cases, in both sets of tests, the entrance to the canals was first sterilized with a hot instrument as it was desired always to test the canals, not the pulp-chamber.

The former method seemed the more

thoro if the more risky, giving greater opportunity for accidental contamination, but in practice proved to give results apparently just like those obtained by the second. The results of the tests are tabulated on next page.

The percentages in the last column were obtained by simply assigning, on the basis of twenty tests to each test a value of five points, and in one or two instances correspondingly more in the case of a lesser number."

RELATIVE EFFICIENCY OF AGENTS USED IN STERILIZATION OF ROOT CANALS OF INFECTED TEETH AS MEASURED BY TWO TREATMENTS OF 48 HOURS EACH.

Formalin	0	0	+	0	0	0	0	0	0	0	0	0	0	+	0	0	0	0	0	—90%
Iodin tinct.	+	+	0	+	0	0	0	0	+	0	0	0	0	0	0	+	0	0	0	+—70%
Chlorphenol	0	0	0	0	0	0	+	0	0	0	+	+	0	+	0	0	+	0	+	0—70%
Form.-Tricres.	0	0	+	0	0	+	0	0	0	0	0	0	+	0	0	+	+	+	0	0—70%
Iodin Creasote	0	0	0	0	0	+	+	+	+	0	0	0	0	0	+	0	0	+	0	0—70%
Iodin agu. XI	0	0	0	0	+	+	0	0	+	0	0	+	0	0	0	+	+	+	0	0—65%
Phenol	0	0	0	0	+	0	+	0	0	0	+	0	0	0	+	+	+	+	0	0—65%
Chloral hydrate	0	+	+	0	0	0	0	+	0	0	+	0	0	+	0	0	+	0	+	+—60%
Eucalyptol	+	0	0	0	+	0	0	0	0	0	+	+	+	+	0	0	+	0	+	0—60%
Chloral hydr. thymol	0	+	+	0	0	+	+	+	+	0	+	0	0	0	+	0	0	+	0	0—55%
Chlorphenol thymol	+	+	0	+	0	+	0	+	+	+	0	0	0	0	0	+	0	+	+	+—45%
Creasote	+	0	+	+	+	+	+	+	+	+	0	0	0	+	0	+	+	+	0	+—30%
Thymol alcohol	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	0	0	0	+—20%
Copper sulphate	0	+	+	0	+	0	+	0	0	+										—50%
Iodoform	0	+	+	+	0	+	+	+	+	+										—20%

Doctor Dahlgren's experiments show that formalin at the end of two treatments of forty-eight hours each is ninety per cent efficient, while at the end of three treatments, the efficiency is expressed by the following table, namely ninety-five per cent:

Formalin	95 per cent
Iodin, tinct.	95 per cent
Chlorphenol	95 per cent
Formalin-tricres.	95 per cent
Iodin-creasote	90 per cent
Iodineiin KI	85 per cent
Phenol	95 per cent
Chloral hydrate	75 per cent
Eucalyptol	75 per cent
Thymol	20 per cent

The lesson taught is that Iodin and formalin can be depended upon if repeated applications of the drugs are made at suitable intervals. The reviewer suggests that four applications be made rather than three. Also the length of time between treatments should be short. Five to eight hour periods give better results than 24 hour periods.

The next work of importance is that of Doctor Percy R. Howe first presented at the Pennsylvania State Dental Society meeting, June 26, 1917, published in September, 1917, Dental Cosmos, page 891. In this paper, Doctor Howe explains and demonstrates his method of using silver nitrate and formalin to produce sterility of tooth structures. This work of Doctor Howe's, I believe to be original and also believe it to be fundamental and of great value. The process in brief is that of silver plating tooth structures. He causes to be precipitated in the diseased portions of teeth, metallic silver, which is left deposited in the tooth structures, and absolutely destroys all bacteria with which it comes in contact, as proven by subsequent attempts to culture from tissues so treated. His technic is simple and easy to master and is in brief as follows:

He prepares a solution of nitrate of silver in water to which is added little by little, strong ammonia. As the ammonia is added, a dark precipitate of silver oxid is thrown down. This soluble in

excess of ammonia. Therefore, he continues adding the ammonia until the solution becomes clear. His second solution consists of a 25% solution of formalin in water. These two solutions must be kept in separate dark bottles with glass stoppers, and should be away from the light as much as possible. They work better when they are freshly prepared, but are still good for a considerable time if kept as recommended. The principle is that of silver reduction. Metallic silver is thrown down in a very finely divided state. It is deposited upon the sides of a clean test tube as a mirror. The principle is used in photography and in staining methods in histology. The action in the tooth is the same. A finely divided deposit of silver in its metallic form occurs wherever the liquid penetrates. By successive applications, a very appreciable thickness of deposit occurs. This may be burnished and made to take on the luster of the metal. The above is taken from the Cosmos for September, 1917.

The objections to Doctor Howe's method are two. The principle one is that the tooth is turned black where the silver is deposited. In view of the further fact, however, that sterility can actually be obtained by the method and in view of the further fact one can protect those portions of the teeth to be operated upon with wax or varnish from the action of the silver, this act of discoloration is overcome. The second objection is that when the material is carried thru the root end, irritation is caused by same, but it seems to me rather to be due to the fact that the ammonia used in the process oftentimes is impure, and much of the irritations complained of by men, who have used this process, can be overcome by making sure that the ammonia used in preparing the silver nitrate is chemically pure.

I herewith submit a recent communication from Doctor Howe on the subject of this work, and I will also show you lantern slides of teeth treated by his method, which show the penetration of the drug in the tubuli.

"I have records of about three hundred cases treated by this method. About one hundred of these cases are root-canal cases. The other are treated abscessed teeth, and deep caries. These are laboratory records and by no means represent all the cases treated in the Forsyth Clinic by this method where it is used as a matter of routine.

Sterilization is produced at once. If at a second sitting bacterial examinations should give a growth, the infection has come from the cellular tissue beyond the root-end. I worked up this method of sterilization in an effort to eradicate caries. This it effectually does, and I have recommended its use as a routine matter in preventive dentistry.

I have studied sections of abscessed teeth and have found that a structural change occurs in the tooth substance when pulp or peridentium is affected for any length of time. The dentinal tubuli disappear and the tooth becomes hyaline. This is a crystalline condition and these areas when completed are sealed. Hot carbol-fuchsin will not penetrate this tissue. Previous to the finished hyaline condition the tubuli are in process of breaking down and are full of infection. This silver material is selective in action, as I have sections to show taken from teeth treated in the jaws and then extracted. It enters the infected tubuli, absolutely sterilizes them and at the same time fills them full of finely divided silver. It will not enter sound dentinal tissue.

The reason for this is that sound dentin contains a coagulable colloid. This coagulates or forms a surface silver albuminate. While in the infected tubuli this albuminate has been digested and is similar to ascitic fluid, or to the fluid of hydrocele, i. e., it is a non-coagulable nitrogenous fluid.

The material is made as follows:

Sol. A/ 3 grams Silver Nitrate
1 c. c. of Water
2.5 C. C. 28% Ammonia

Sol B/ 25% Formalin

It is for use within the tooth, and distinction must be made between cellular tissue or peridentium and of pulp, and the dentin of the tooth. In the cellular tissue use Dakin solution, and physiological salt or drainage. Apply the rubber when possible and flood the pulp cavity, but little forcing of the liquid is advisable with solution A. Follow with a

drop of solution B; repeat about three times. Work this material with a smooth broach lightly. Capillary attraction will carry it. Dry out, apply the silver solution, or solution A, and follow with eugonol.

If a dead pulp exists do not remove it at first, but apply the material freely. It will go into any canal that a broach cannot enter, and around any crook. It will fill all foramina wherever they may exist.

When using in caries if near the pulp, apply a paste of eugenol, zinc oxide, and the silver solution. Smear this over the pulp; then treat the diseased dentin with the material.

In this work we have had six operators. There is considerable technic. We have had only three teeth to extract in the work of these men. All this work has been followed by actual cultural examinations, and if clinical symptoms indicate anything, we have succeeded in curing many badly abscessed teeth in children's mouths. The tissue has become pink and firm, and large contoured fillings have been inserted."

It will be noted that Doctor Howe has not submitted a series of dated and signed records, and that his work lacks evidence of laboratory tests. It should be remembered, however, in this connection that this method is being tested in a clinic in which the attendance of children numbers several hundred per day. As his article in the Cosmos shows, they are saving successfully infected first and second molars, which are as we all know, the first teeth to suffer in the mouths of children who have not been trained to take care of their teeth. Therefore, what this contribution of Doctor Howe's lacks in laboratory tests, is in some measure compensated for by the broad application of his experiments upon the teeth in the mouths of hundreds of children.

The principle of the reduction of silver in tooth structures as a sterilizing agent is further supported by some recent work of Doctor U. G. Rickert, of the University of Michigan. I herewith submit a very brief communication from Doctor Rickert upon this question:

"I can think of no greater service to the dental profession today than the one now before us, that is, the standardization of root canal operations. Personally, I would have preferred to have been excused from offering any data at this time because of the limited amount of work I have as yet done in this field. On the other hand, I realize that if all of us waited until the last word had been said on the subject, much valuable time might be lost.

Inasmuch as I had never intended to formally report the work that I have done, I will be obliged to give a recital of experience rather than a concise tabulation of facts developed by special research. I mention this because it will explain this smattering report.

Early last fall I planned to work out a practical routine for root canal treatment for both my private practice and for clinical purposes. I decided to make cultural tests to determine sterility of all canals before filling, and I was certainly surprised to find the utter inefficiency of one drug after another in which I had confidence. I found that one of my pets, phenol-compound, which I had been using in anterior teeth, could not be relied upon for sterilizing badly infected canals. Most dressings were infected in 24 hours and practically all in 48 hours. I had been depending on iodized-phenol in posterior teeth but found it likewise undependable. Formocresol, while maintaining sterility longer than either of the above, also became infected after several days to a week. Oil of cloves is of no value as a disinfectant.

As an experiment I took single rooted teeth fastening them into thin cork so that two-thirds of the root passed thru the cork. These are then fitted into short glass tubes filled with media, after which they are autoclaved. I took several of these and reduced silver into the canals and left them standing for 24 hours, after which I sealed into the pulp chamber a mixed culture of the flora of my own mouth, and in no instance was there any growth in the media. I had sealed the apical foramina. Experiments with silver, a modification of Howe's method, is the only way I have been able to sterilize canals with certainty. There are serious objections to this method, however, owing to the possible irritation, if thoro sterilization of the root canals to the apex is to be had. It is somewhat difficult to control the exact amount to be administered in each case and avoid destruction of periapical tissue. I have, however, modified Dr. Howe's method so that it is less irritating, by using a mini-

mum amount of water with a maximum of silver. This may be done by using the strong amonia and dropping in silver nitrate until there is but slight, if any, precipitation of silver oxide in solution of ammonia. This solution should be freshly prepared before use. Care in administration will prevent serious irritation.

Another precaution that must be considered is the purity of drugs. Observation by myself and others has convinced us that some of the serious irritations that have followed the use of this treatment have been due to impurities, especially of the ammonia. Another objection to this method which limits its use is that of the dark discoloration.

I am at present working on a method intended to remove the serious objections of the silver method. This is not definite enough yet to be given out. I mention the silver method because laboratory tests have convinced me of its efficiency. It will sterilize dentin to the cementum.

I also found by using the tubes described above with mixed cultures in the media, that dressings sealed into canals were unable to maintain sterility for any length of time.

As will be observed, the agents tested were not an extensive list, but the ones we had been accustomed to use and depend upon. The small amount of work I put into it certainly convinced me of the unreliability of most of the agents we are now using. Let us hope that something may soon be found which will be effective with the least injury to the periapical area. I shall await with interest the data to be collected for the Chicago meeting."

The above communication from U. G. Rickert is exceedingly valuable as it confirms the statement made by Doctor Percy Howe, that the silver reduction method does sterilize dentin. A careful reading of the magnificent work done under Doctor W. A. Price's direction on 104 sterilizing agents, reported at our last meeting in New York and printed in The Journal of the National Dental Association for March, 1918, page 295, in which Doctor Price made exhaustive tests of these drugs and this method by treating a series of teeth and then cutting them to pieces and culturing from different areas of the tooth structure, shows conclusively that this material always sterilizes everything that it reaches. His conclusions in regard to this method are:

"In comparing the results obtained from this method of treatment with the results from other methods obtained as in his other experiments, there is inclination to the belief that a perfected technic will produce sterilization of the tooth structures which are reached by the medicament in so short a period as ten minutes.

In comparing the four trials, the ascending percentages in efficiency leads to this conclusion. The sterility in the cultures obtained from the root canal proves the toxicity and bacteriacidal power of this treatment in the canal itself."

It must be remembered, however, that there are portions of the root and tooth which cannot always be reached by this method, so we cannot say to ourselves that we can always produce absolute sterility of the tooth tissues, but it is interesting to have Doctor Howe's recent letter confirming from a clinical standpoint at least, the value of the method in the treatment of the teeth of children, and the testimony of Doctor U. G. Rickert and Doctor Price favorably commending this method and these drugs.

I now come to a brief review of the splendid piece of work by Brooks and Price from which I have just quoted. It is the most exhaustive piece of work of its kind which has ever appeared. The laboratory tests of 104 different drugs have been conducted under what seems to me to have been exceedingly careful and exacting laboratory methods. At the time this article was submitted for publication, I felt that the article ought to have been condensed for the reason I feared many of our members would not carefully read it. My feeling in the matter from my own experience was and is that much of the best material printed in our dental journals is unread by the majority of the profession. In preparing this report, I have been compelled to carefully read every word of this

lengthy series of experiments, and I have consulted many of the references. If I may be pardoned for uttering an opinion, where only facts are wanted, I will take this opportunity to say that the money contributed to the Research Institute will have many times been repaid to the profession by the conclusive evidence as to the non-efficiency of the great majority of root canal sterilizing agents hitherto in use. The work of the Research Institute in this particular should be re-read and carefully studied by every man in the practice of dentistry, and if the effort to point out the way of safety is followed by the profession and the numerous inefficient drugs for sterilizing tooth substance are discarded and only those which present indications point to are used, thousands of lives may be saved.

Let me call your attention to two or three things in this report of Doctors Price and Brooks. We note first that almost without exception, all of the ordinary drugs used for tooth sterilizers, do not sterilize. Second, the profession is frequently mislead as to sterility thru the comfort of the patient, resulting from tooth treatment, and from the fact that cultures taken at the close of medication show sterility when the tooth is not sterile, and when bacterial growth has only been retarded. We note also in this article, that the only certain test of the maintenance of complete sterility can be had by examinations at stated periods of hours, days, and weeks. Painstaking examinations were abundantly made and carefully checked up by Brooks and Price, with the almost universal result that infection was in the majority of cases not overcome at all,—simply retarded. Their general summary and conclusions are as follows:

"1. Infected dentin and cementum are not readily sterilized by medication, even when the amount of medicament is largely in excess of the mass of tooth structure.

2. The medicament contained in a medicated root dressing very readily and rapidly loses its disinfecting power, for the dressing itself becomes infected in a few hours, even from the infected dentin and without being in contact with an infected solution.

3. The medicament in the dressing dissipates more rapidly when one end of the dressing is in contact with an infected culture medium, such condition as obtains in a periapical infection.

4. The efficiency of a root treatment is greater a few hours after it has been placed in the tooth than after several days, or even one day's time.

5. All areas of cementum and dentin are difficult to sterilize, as well as tend to reinfection, when the medicated root dressing is left more than a few hours.

6. The medicaments that are most efficient, namely, silver nitrate and formalin, are very objectionable, the former by its discoloration and the latter by its destructing and irritating properties, except when used very dilute and for a short time and then quite efficiently.

7. There is much encouragement in the use of Chlorazene and Dichloramin-T products. They are, however, exceedingly painful and destructive in over half of one per cent strength.

8. We now understand why it has been that if a root treatment is left in the tooth for an extended period of time it becomes foul in odor. Also a verification of the observation previously reported by one of us, Price, to the effect that medicated root dressings will always show bacterial growth after they have been left in infected teeth for a few days.

9. These determinations indicate to us that an exceedingly small per cent of the teeth that have been treated by members of the dental profession in the past have actually been sterilized.

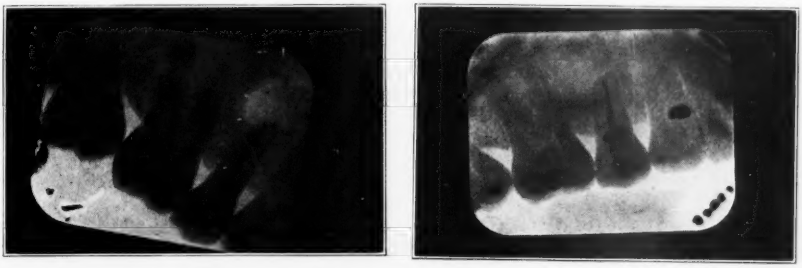
10. Nature is, and has always been, very tolerant, and much of the credit that has been taken by, and given to, the dental profession for the sterilization of infected roots has already been due to nature for her kindness in tolerating, at least without local irritation, a probably almost universal and permanent condition of infection, tho in lessened amount, when tooth structures have once been infected and have been subjected to treatment."

We now have reason to hope, however, that the silver reduction made by precipitating into the structure of the tooth

itself, metallic silver, (which we all know is well tolerated by the tissues of the jaw), that we have at least gained a foothold in the art of sterilizing infected teeth.

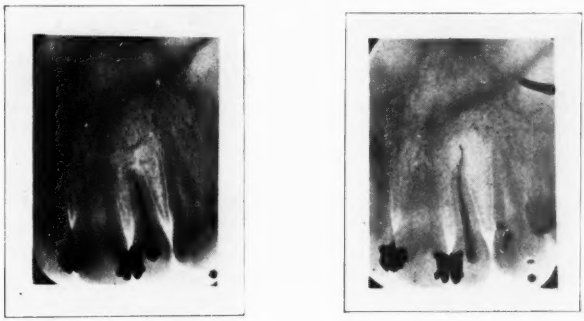
The work of Dahlgren was conclusive too, that repeated applications of iodin and formalin will also sterilize dentin, and we also know that iodin is well tolerated by the tissues. Therefore, out of the mass of research, we have at least two drugs, which we can reasonably expect to help us sterilize dentin. Never in the history of the world has the necessity been so great. In closing my remarks, allow me to say that heart disease is upon the increase. A report from the "Census bureau's summary of mortality statistics for 1916" shows that the deaths from heart disease for that year were 114, 171 or 159.4 per 100,000 population, while in 1915, there were 102,202 deaths.

Mr. B.



The above was treated as follows: Rubber dam applied, tooth scrubbed with iodine. Pulp chamber opened and dead pulp removed. Pulp chamber treated with sodium and potassium for five minutes followed with hydrogen dioxide. Pulp chamber flooded with chemically pure sulphuric acid for three minutes. Dressed pulp canal with tincture of iodine at three different intervals. Root canal was then filled by Callahan method and root end amputated at same sitting. Evidence of re-growth of bone after a period of six months.

Miss B.

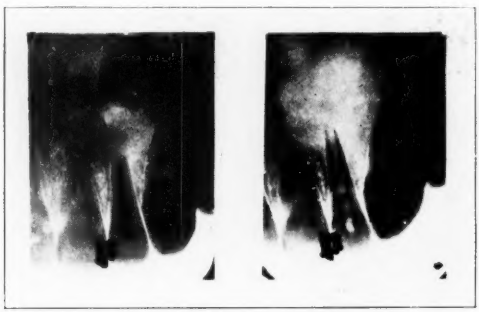


Abscessed tooth treated as follows: Rubber dam applied, tooth scrubbed with iodine. Pulp chamber opened and dead pulp removed. Pulp chamber treated with sodium and potassium for five minutes, followed with hydrogen dioxide. Pulp chamber flooded with chemically pure sulphuric acid for three minutes. Root canal filled by Callahan method and root end amputated at same sitting. Evidence of re-growth of bone after a period of six months. Patient had swollen ankles and insteps for four months prior to removal of dead pulp. Since ridding the patient of this mouth infection, swelling has disappeared and evidence of inflammation in the ankles and insteps has disappeared.

The above figures do not comprise all the deaths in the country as the tabulated reports only cover 70% of the population. It will be recollected, that ulcerative endocarditis, the commonest form of heart disease, is purely due to streptococcal infection. The workers, of the Minnesota Division of the Research Institute, have repeatedly obtained the streptococcus in the human heart on the post mortem table, and have repeatedly made organic lesions in the hearts of rabbits by the use of cultures, ordinary saliva. Therefore, the need for increased efficiency for the conservation of teeth is exceedingly great. Life can be and will be saved by the work these men have done, and I am sure that the bulk of the dental profession will conclude that the work of the Research Institute of the National Dental Association is worth perpetuating. It certainly would be possible for the dentists in the country to cut the death rate from heart disease alone in half, and reduce as well many other common forms of disease due to streptococcus infection by maintaining asepsis in all their operations.

I herewith submit a trifling bit of observation of my own, which evidence is clinical as to the efficiency of sodium potassium and sulphuric acid combined for sterilizing root canals. In fairness, I should say that I have not studied the question of the sterility of the tooth structures, in question save clinically. I have record of twenty cases in which an attempt was made to sterilize tooth structure as follows: The root canals were evacuated by the ordinary methods and thoroly burned out with Schreier's sodium potassium paste, after which chemically pure sulphuric acid was introduced into each canal and allowed to remain for three minutes. The canals were then wiped dry with sterile cotton points and filled by the Callahan method. The root tips of this series of twenty teeth were all amputated, and I herewith wish to show you three or four X-ray pictures, showing bone rebuilt to the root ends. In two instances, I have cut down into the tissue to examine the bony repair and find the bone built completely around the root end. It may be fairly assumed that sterility of the tooth structure of these teeth has been complete.

Mrs. D.



Abscessed tooth treated as follows: Rubber dam applied, tooth scrubbed with iodine. Pulp chamber opened and dead pulp removed. Pulp chamber treated with sodium and potassium for five minutes, followed with hydrogen dioxide. Pulp chamber flooded with chemically pure sulphuric acid for three minutes. Root canal filled by Callahan method and root end amputated at same sitting. Evidence of re-growth of bone after a period of six months. Patient complained of a chronic dyspepsia. Since the correction of the mouth infection, the patient makes the statement that she is in excellent health and digestion seems to be perfect.

THE CARE OF THE EYES.

By Cassius D. Wescott, M. D., Chicago, Illinois.

(Read before the Chicago Dental Society November 19, 1918.)

LADIES and Gentlemen:

I have been asked to talk to you about the care of the eyes. I thank you for the opportunity, and regard it as an honor, and a privilege. It is obviously impossible to cover the entire subject in one paper.

Much that I shall say will be very familiar, and all will be very elementary. It is suggested by years of experience with eye sufferers of all classes, and the fact that I have found many professional people very neglectful, if not actually ignorant, of the principles of ocular hygiene emboldens me to present the matter in the way that I do.

The eye lids are for the protection of the globe, their frequent movements, in winking, for polishing the cornea which is the window to the eye, and the first lens of the camera.

The skin of the lids is the most delicate on the surface of the body, the most easily irritated, and inflamed. Along the edges of the lids are many hair follicles and oil glands, which are easily infected.

An infected hair follicle is, as you know, a style, and an infected meibomian, or oil gland, is called a chalazion. As we usually see these things they are regarded as trifling, but in a professional man, doing such work as you and I do, they are of real moment for they are a bar to full efficiency to say nothing of the pain and discomfort which they cause. Undoubtedly there are constitutional conditions which predispose to these things, but eye strain and direct infection have much to do with their causation.

I have seen chancre, sporotrichosis, blastomycosis, and tuberculosis of the lids, all due to handling the lids, or rubbing the eye with unclean fingers. We should be very careful not to touch the eyelids without washing the hands, and at least twice a day, we should bathe them with warm water and a good soap, followed by a dash of cold water.

If the delicate, mucous membrane covering the globe and lining the lids, becomes irritated by dust or smoke or sulphur gases which are so abundant in our atmosphere just now, there is an increased sensitiveness which is aggravated by reading or other near work, and there is an increased secretion of mucous, which causes an annoying blurring of vision, both conditions tending to reduce ocular efficiency.

Cold bathing of the closed lids, two or three times a day, has a tonic effect upon the circulation of the eye, but we should not wash the eyes out with plain water. It is best to thicken it a little with boric acid, common salt, or borax—an isotonic solution is much more agreeable to the eye, and just as cleansing as water. If the eyes are persistently red, or irritable, more astringent lotions may be desirable.

Hot water should not be used except upon the advice of an oculist. While very useful in some acute inflammations of the eye ball, both external and internal, hot water is too relaxing to be used frequently under other conditions. The

use of a simple cleansing lotion once, or twice a day regularly could do no harm, and would be very helpful to most city dwellers.

The commonist accident to the human body is the getting of a mote into the eye, and the delicate structures of the globe are so easily infected, and so often permanently damaged by slight injury, that every one should know how to examine an eye for a foreign body, and to remove one, if present, if it can be done without the skill and appliances possessed only by the eye surgeon. A wooden toothpick, upon the end of which a little clean cotton wool has been tightly twisted, is a very effective instrument for turning a lid, and removing a mote from beneath it, and many foreign bodies lodged in the cornea may easily be removed by the same means if a drop of 4% cocaine solution is first installed into the eye. An eye containing a foreign body which cannot easily be removed, or an eye which has been cut, or scratched, should be tied up immediately with a sterile dressing, or a clean handkerchief, until an expert can be consulted. All penetrating wounds of the eye ball, and even superficial wounds of the cornea, should be regarded as serious, because if they do not heal promptly, and without infection, sight may be destroyed, or greatly impaired. Immediate skilled attention is demanded and cannot be of too high a quality.

There are various inflammations of the eye, both from external and autogenous infections. Some are serious and others self limited and simply disabling. All call for early diagnosis and skillful treatment, and sometimes more can be done to avoid disaster in the first day than in the rest of the patient's life time. Focal infections, especially of the teeth and sinuses, play a very important role in eye surgery. Trifling injuries of the eye often result disastrously when complicated by autogenous infection, and many intraocular inflammations are now known to be due to bacteria.

The most wide spread of all eye troubles is eye strain. Eye strain and its effects cause more pain and disability than all other eye troubles put together. It probably is responsible for more headache than all other things, to say nothing of eye pain and fatigue, facial spasm, nervous dyspepsia, nausea, vertigo, general fatigue and nervousness, lack of power of concentration, sleeplessness, and many other ills, aside from its effect upon the health of the eye itself. As we ordinarily consider it, eye strain is due to our efforts to use our imperfect eyes without correcting glasses, or with glasses improperly fitted, but a perfect eye may be strained by improper use, by too much work without proper periods of rest, and in bad light. But of course it is the defective eyes that cause the most trouble, and there are very few eyes in which we find no measurable optical defect.

Only about ten per cent of all eyes conform so closely to type that we call them normal. At least sixty per cent are so defective as to cause ill health, reduced efficiency, or poor sight. The defects of the balance are compensated for by a vigorous accommodation in strong, or insensitive individuals, mostly in out of door occupations.

In order to understand eye strain and its results, we must have a fair comprehension of the function of the eye and of its defects. Let me remind you that we do not literally see without eyes. We see with our brains a picture formed in the eye acting as a living camera. The cornea, the aqueous humor, the crystalline lens and the viterous constitute its dioptic system, the optical center of which is at the posterior surface of the lens. The iris is a perfect diaphram automatically contracting and dilating to regulate the amount of light entering the eye, and at all times, shutting out marginal rays. The delicate retina not

only forms a most excellent screen for the reception of images, but has the marvelous power of transmitting these impressions thru the fibers of the optic nerve to the brain as definite sensation.

Rays of light entering the eye from an external object will undergo a series of refractions, all tending to make them more convergent, and a real and inverted image will thus be formed of any external object to which the eye is directed. If this image falls upon the retina, the object is seen; and if the image thus formed is sharp and sufficiently luminous, the object is seen distinctly. Imperfect vision may be due to faulty development of the eye, or to acquired optical defects, to pathological changes in the tissues of the eye, or to disease or injury of the brain. One may have a perfect eye, and yet be quite blind, as in tumor of the hypophysis, for example.

By the refraction of the eye we mean its power, when at rest, of focusing parallel rays of light. By the accommodation, we mean the power which the eye has of adapting itself to vision at different distances. The chief factors of accommodation are the elasticity of the crystalline lens and the action of the ciliary muscle. By the action of this little muscle within the eye, the lens assumes a more spherical form. As its convexity is increased, the refracting power of the eye is increased and it is adopted to vision at the near point.

In the normal eye, parallel rays of light, or those coming from a distance, are focussed upon the retina when the eye is at rest, that is without the aid of accommodation. Such an eye is said to be emmetropic.

The hyperopic eye is the short eye, the undeveloped eye, and obviously parallel rays will be focussed by such an eye, when at rest, at some point back of the retina. A blurred image will be formed on the retina, unless by the aid of the accommodation the refraction of the eye is increased sufficiently to bring parallel rays to a focus upon the retina in its faulty position. People with such eyes are sometimes spoken of as far-sighted, because they see more easily in the distance, than at the near point, tho they see nothing clearly at any distance without an effort.

We are all born hyperopic, and the new born baby sees nothing distinctly. He often manifests little muscular coordination too, and alarms his mother by looking cross-eyed. If the baby is well nourished, and escapes the serious diseases of infancy, the eyes grow and round out with the development of the body generally. Many children of school age, however, have very defective eyes, and as soon as they are more confined in a school room, which perhaps not too well lightened, and begin to use the eyes more at the reading distance they may begin to have red eyes and to complain of headaches, or other symptoms of eye strain. We see many hyperopic eyes improve when glasses are worn, and remain healthy and strong with eye strain relieved. When errors of refraction are not corrected early, the tendency is toward the development of myopia, or near sight especially if there is much astigmatism and the eyes are improperly used, in bad light, bad position, etc., but headache, restlessness, nervousness, or apparent dullness and stupidity are usually manifested first. The backward child is usually a defective child and easily becomes a truant.

Myopia is that condition of the eye in which parallel rays of light come to a focus in front of the retina. It is usually an acquired defect and is due to straining an eye, whose coats are perhaps already weakened by malnutrition. The myope sees nothing clearly in the distance without the aid of concave glasses but may be able to see very well at the near point without glasses even to an extreme age. The myoptic eye is a diseased eye and the condition tends to increase with constantly diminishing

vision and destructive changes in the retina. Many cases go on to blindness, and all could be prevented except the very few which are congenital. In an experience of nearly thirty years, and with 15,000 patients, I think I have seen three cases of congenital myopia and I am doubtful about one of those.

Astigmatism is that condition of the eye in which the refraction is not the same in all meridians. It is usually due to imperfect curvature of the cornea. Obviously we may have a great variety—hyperopic, myopic, simple, compound, and mixed. It is usually a congenital defect and seventy-five per cent of all eyes are more or less astigmatic. In high degrees of astigmatism it is impossible for the patient to improve his sight by any effort and he ceases to try, contenting himself with his poor vision and losing his symptoms of strain, but in the low and moderate degrees it is possible as in hyperopia, to improve the sight by an unconscious effort and symptoms of eye strain are the result. Some of the very worst headaches that I have seen have been in indoor workers, with perfect vision, but who saw well at the expense of a constant effort. When the necessity for the excessive use of the accommodation was relieved by glasses the headache ceased promptly. *Eye strain is not inconsistent with perfect vision.*

Presbyopia is a failure of the accommodation due to age. Just as all our tissues become denser and finer with age, so the crystalline lens becomes progressively harder, and less responsive to the action of the ciliary muscle. The lens really begins to lose its elasticity early in life, but when the emmetrope can no longer read at a convenient distance, we say that he has become presbyopic, and in normal eyes presbyopia usually occurs at about the forty-fifth year, and convex glasses then become necessary for reading and other near work.

Many cases of eye strain are due to faulty muscle balance. Whenever we look at anything, far or near, those of us who have two useful eyes not only focus each eye for the proper distance, but we bring both eyes to bear upon the object in order to secure the advantage of stereoscopic vision. It is by means of binocular, stereoscopic vision that we estimate distance and appreciate relief and the man who has lost an eye is very much handicapped, especially in doing such work as falls to your lot and mine. After a time, however, the one-eyed man acquires a new ability to estimate distance. This new sense probably has some relation to the amount of accommodation used in seeing clearly objects at different distances.

As you know, binocular single vision is made possible by the harmonious, coordinated action of six pairs of extraocular muscles. Sometimes for one reason or another, these muscles fail to act in harmony and the patient is obliged to make a constant, unnatural effort to keep his eyes "in line." This constitutes one of the most troublesome forms of eye strain and sometimes the most difficult to remedy. The commonest form is that in which the eyes tend to diverge from feeble convergence power, or excessive action of the external recti muscles. Sometimes one eye tends to look higher than the other. Most cases of eye strain due to muscle imbalance can be relieved by careful study and treatment, and repeated changes of lenses, but some cases cannot be permanently helped, except by operation.

One of the most prolific sources of eye strain is faulty illumination. The eye "reacts" most easily, in steady diffuse day light, such as we get in our offices for a few hours on clear days, from a north window. Few of us have day light long enough and sufficiently uniform for our work. We must therefore have artificial light, and the problem is to get that form of illumination which will make for the greatest visual efficiency. If we have too little light of any kind,

we will strain our eyes, because in order to see things well enough we must get them very near in order to get a larger retinal image than would be necessary in a stronger light. As the amount of accommodation, and convergence used are directly dependent upon the nearness of the object, the nearer we are obliged to approach the thing we wish to see, the more effort we will expand in order to see it.

While the illuminating engineers tell us that good diffuse day light, from a north window, measures, photometrically, about two foot candles, there is a great variation in the amount of light required by different people, and at different ages in order to see most easily. Generally speaking, the older we grow, the more light we require, but we should always remember that more harm comes from glare and too much light, than from not enough, and should always strive to obtain a soft indirect light which gives us clear vision with the least discomfort.

From the foregoing it is evident that the chief problem in the care of our eyes is to avoid eye strain. Every child should have a careful physical examination before beginning school work in order to discover any defects. Those which can be remedied should be corrected and if there are some which cannot be helped, his life should be so adjusted as to enable him to accomplish most with the least wear and tear. We all dislike to see children wear glasses, and no doubt the constant use of spectacles interfere somewhat with a boy's normal activities, but very often can be accomplished by the use of glasses for near work only, and it is seldom necessary to wear them all of the time to the exclusion of such games as football, etc.

As I have already hinted, the early correction with glasses of hyperopia and astigmatism often prevents the development of myopia with its serious consequences, and my own records show that the early use of glasses often promotes the normal growth of the eye, and the spectacles may frequently be discarded after a few years. Sometimes indeed, they are of use to bridge over a period of special stress and may be discarded after a few months, or a year. Glasses that are needed and which are properly fitted, can do no harm, but only good. If they are not needed, or are improperly fitted, they will usually be rejected and not worn.

Physiological changes are occurring constantly, and the eyes should be re-examined from time to time, and the lenses readjusted to meet the changing needs of the eyes. All need glasses for near work at above 45, even if the eyes are quite normal, because of the changes due to age; and after that time the eyes should be thorolv examined every two years. The question of the constant use of glasses at any age is a matter of the individual, and must be decided after due consideration of the condition of the eye, the nature of ones work, etc. The adjustment of the lenses before the eyes is a matter of great import, because of the fact that we get the true effect of a lens only when we look thru its center at right angles to its plane. A lens for the correction of astigmatism has an axis which always must be parellel to the best meridian of the eye. Spectacles are best for the correction of astigmatism because the correct adjustment is more easily maintained. If astigmatism is not accurately, and constantly corrected, the relief of eye strain is not only incomplete, but the strain may be aggravated.

I suppose I must say something about the use of "drops" in the fitting of glasses. No examination of the eye is complete without the dilation of the pupil, because it is impossible satisfactorily to examine the periphrey of the lens, and all parts of the retina and choroid thru the small pupil, and the conditions disclosed by the opthalmoscope are often of the utmost importance to the patient. As you know, the first

evidence of arterio-sclerosis, nephritis, diabetes, syphilis, and brain tumor are frequently seen with the opthalmoscope to say nothing of cataract, retinitis, choroiditic, and optic neuritis due to other causes.

Also while there is any accommodation left it is impossible accurately to measure the optical defects of the eye without first paralyzing the ciliary muscle. This is why we use atropine and homatropine. The danger of harm or discomfort is so slight that the advantages outweigh the disadvantages a thousand fold.

Glare and excessive light cause irritation and congestion of the choroid and retina predisposing the eye to inflammation of these delicate structures with resulting malnutrition of the lens, and the production of cataract. Indirectly there is much fatigue from retinal exhaustion and pupillary spasm. The remedy, it seems to me, is indirect illumination with light walls, preferably cream color or light gray, and a sufficient number of units to enable us to regulate the intensity of the diffused light. Of course such a plan is expensive, as compared with direct lighting, but the saving in comfort and sight will make it pay.

If the indirect method is not available, for any reason, we should adopt a plan which will at all times protect our eyes from all direct rays and which is susceptible of variation to suit the conditions. In my operating on the eye ball, I use the Nernst lamp which gives all the light required and can be so adjusted as to position and distance that I can secure just the amount of light needed without direct light in my own eyes. Whether this lamp would be practical in your work I do not know.

I must, however, warn you against any form of illumination which exposes your eyes to direct rays, especially from an electric lamp. Day light should be used as far as possible and it seems to me that a perfectly diffused, indirect light would be the best substitute. Glasses should be used for the full correction of presbyopia, and for all errors of refraction before the presbyopic age. The form of the glasses is a matter of individual choice. Frequent rests, or change of focus, during near work, are very necessary in order to avoid strain.

The general direction which I have suggested are of course applicable to the dentist as well as to all who use the eyes much for careful, painstaking work.

Discussion.

C. N. Johnson, Chicago, Ill.

This is a subject of prime importance to dentists, and I feel the society is to be congratulated on having a presentation of this kind from a man of the ability of Dr. Wescott. I want to take this occasion to pay my respects to Dr. Wescott for coming here tonight because I know he has done so at a great sacrifice in preparing this paper and presenting it to us. I feel under deep obligation to him, and I am sure the whole society does.

He spoke of infecting the eyelids by rubbing them with unclean fingers. This recalls to my mind an incident that was mentioned many years ago by the late G. V. Black of the case of a young lady who had some affection of the eyelid which the oculist was unable to clear up after extended treatment. The case was very puzzling until is was found that this young lady had an abscess of an upper lateral incisor on the side of the mouth that the affected eye was upon, and she was in the habit of breaking this abscess with the finger when it was filled and subsequently rubbing the eye with the finger, and that eye was not cured until this habit was stopped, and when the habit was stopped the eye got well without treatment.

Dr. Wescott has mentioned many diseases that may be carried to the eyelids in that way.

Another matter that has interested me

for many years in connection with operating is the arrangement of the light in the operating room. Dr. Wescott has called attention to the fact that it is possible to have too much light, and this was impressed upon me many years ago when I had an office in the old Chicago Opera House Block, and the whole front of the operating room was glass. I had the theory, which many dentists had that the more light I could get the better. Dr. Brophy came into my office one day and said, "Johnson, you will ruin your eyes with so much light; you don't need so much light." After this my friend, the late Dr. Henrotin, said the same thing to me, and I paid attention to what they said. I cut off the light of one whole window and operated more comfortably; then I shut off the light from the lower pane of glass in the window in front of the chair and operated simply with the upper pane, and then I operated more comfortably because there were no rays of light reflecting in my eyes.

When the plans were made for the building I am in now, I rented an office before the building was up, and I remember a friend of mine called me on the phone and said, "Have you seen your office yet?" I replied I had not, and he said, "I climbed up ladders to get there, and I want to tell you that you will have to use gas light or ruin your eyes." I said why? He replied, "Because you are not going to have light enough; you have nothing but small windows, and they are away up." If I had ordered these windows myself they could not have been better, because I have operated comfortably in that room for twenty-five years with a small window, but that window is well up.

I think it was the late Dr. Bing, of Paris, who called the attention of the profession to having so much light in the operating room and insisted on having a small light high up and the light coming straight down in the patient's mouth. I have gone on that basis ever since. I have not had the walls of my operating room light colored; I have had them dark colored; they absorb the rays of light and do not reflect it back in my face. About two weeks ago I was in New York City and stepped into an office of a dentist that was very magnificently furnished. I found this arrangement of the chair: the chair faced the north window and the operator in standing at the chair faced the west window, and the first thing I said to him was that he would have to shut off the light from the west window or he would ruin his eyes.

Another habit of dentists is to have the operating chair placed in a bay window. This is a great mistake from my point of view and from Dr. Wescott's I am sure. The window you are facing is a constant strain on the eyes; tho you may be unconscious of that fact. You want good light, but you want it in the patient's mouth and not have the rays of light coming into your eyes. I am going to pay more attention to my artificial light after this, and the suggestions made by Dr. Wescott in that regard were good.

I want to give one practical suggestion about protecting the eyes in casting gold. We are all casting gold now, and sometimes it is not convenient to put on colored glasses. In casting gold without colored glasses, every one of you are subjecting the eyes to undue strain, unless you take the precaution I am going to mention. You may not be conscious of it now but you will after a time. A little trick I have been using for a long time is to shut one eye and make a funnel of the hand so as to have a peephole not larger than the head of a pin and directing that on the gold, and you can tell exactly the melting point and the character of that gold perfectly without any strain upon the eye whatever. You can get a more perfect vision of the outline of the gold that is being melted. I can-

not do it with both eyes or with one eye unprotected in that way, but I can tell instantly, after making that slight funnel and a little peephole, the melting point and character of the gold without any strain. I commend that to you who are casting gold at all times and do not want to use colored glasses.

I think many dentists make a mistake in deferring the wearing of glasses too long. Dr. Wescott has brought that out beautifully and has given us the reasons. There is naturally a prejudice on the part of the average individual against wearing glasses. I had that impression, and I think most people have the idea that the longer you can get along without glasses the better you are; that the moment you begin to wear glasses you are a slave to them.

Dr. Wescott has shown very clearly that is a mistake. I think our young dentists should bear that in mind and profit by it. I am not sure that I did not operate for a long time when I should have worn glasses. I dreaded the putting on of glasses; I was afraid my patients would comment on it. As a matter of fact, when I put them on there was not a patient that knew it; if they did, they did not say anything to me about it.

Here is something that came into my experience, and I would like Dr. Wescott in closing to throw some light upon it if possible, or if he thinks there is any virtue in it. I am wondering if it is true that conditions of pyorrhea have a bad effect upon the eyes. About a year ago a young lady came to me with her teeth in rather bad condition. One or two should have been extracted at once, and I told her so. But she begged of me to see what I could do in treating them. There is one upper molar that is very loose. There are two lower lateral incisors, one of which has elongated from time to time. It had to be ground down until the previous operator had gone into the pulp and had filled the canal from the incisal edge. The other lateral incisor had started in the same way. I was successful in arresting the flow of pus. I have been arguing with her from time to time as diplomatically as I could to have that molar extracted, but she has protested. Her mouth today is very much healthier than it was a year ago, and she said to me incidentally the other day, "Dr. Johnson, I have been cured of the necessity of wearing glasses by the treatment of my teeth; I do not have to put glasses on now to see perfectly, and before you began to treat the pyorrhea in my mouth, I was a slave to glasses."

Now, I am not one of those who jumps at conclusions, nor do I believe that one swallow makes a summer. I have grown gun shy of forming opinions on one or two cases. I simply throw out the suggestion that we may be doing our patients good when we clean up the mouth, even tho we do not extract all the teeth that are in the mouth. There are two teeth in that patient's mouth I would like to extract on general principles. This young lady is much healthier than she was, and I am wondering how much this increase in good health has had to do with remedying the condition of the eyes.

H. I. Van Tuyl, Chicago, Ill.

I want to thank Dr. Wescott for preparing this paper and reading it to-night. I also congratulate him on the conciseness of his paper which covers so much ground in such a clear manner. I hardly feel able to discuss it.

The eye is a very sensitive organ, but it is not the most sensitive organ in the human body. The ear is more sensitive than the eye; that is, the ear is more sensitive to the vibrations of sound than the eye is to the vibrations of light. It is wonderful to see how nature protects these delicate organs. The organ of hearing is protected by the petrous portion of the temporal bone. The eye is protected by a mass of fat in which it lies and by a surrounding wall of bone.

While the eye is a very sensitive organ, we very often see it abused.

In studying the affections of the eye and their treatment, and this applies to other parts of the body such as the teeth, etc., one should have a thoro knowledge of the diagnostic value of pain. There is a little book especially rich in information along this line. It throws a great deal of light upon the diagnostic value of pain and nature's hint as to the treatment. It shows the close relationship of different parts of the body thru the nervous system; how pain in a certain part of the body may mean disease in some distant part. This little book is by Hilton and entitled: "Rest and Pain." I heard a famous surgeon once say that no medical student should graduate without having read this little book, and I might add that every dentist should have it in his library. Let me quote a passage in regard to the eye: "Having examined the distribution of associated nerves in the joints and serous membranes, and pointed out some of its results, as evidenced in the symptoms induced by it in the diseases of those parts, I now propose to consider briefly the same anatomical functional arrangements as they are manifested in the mucous membranes and their directly associated muscles. Let us look, for instance, at the confunctiva, the orbicularis palpebrarum, and the skin covering the eyelid, in their due anatomical and physiological relations. These parts stand very much in the same relation to each other as the synovial membrane of a joint, the muscular apparatus moving that joint, and the skin over the insertions of the muscles. We find that the facial nerve is one of the motor subdivisions of the great cranial compound nerve constituted by the large origin of the fifth nerve, as the sensitive root, and the third, fourth, fifth, (motor portion), sixth, and seventh cranial nerves, which together form the motor roots of this cranial nerve: the whole of this nerve association structurally resembling a common two-rooted spinal nerve. The sensitive root of the fifth nerve supplies the confunctiva and skin with sensation, and the facial nerve supplies the orbicularis palpebrarum, the muscular apparatus, with motor power. These two nerves are most intimately associated both anatomically and physiologically, hence the constant and active sympathy between these parts. Now notice what happens when the eye is inflamed, or if the light is too strong for the eye. The eyelids are immediately closed—the eye is placed in darkness, which is the eye's "rest." Here is an indication on the part of nature which has been visible to mankind from one generation to another, and soliciting, as it were, attention; yet how little is it appreciated, how rarely made the guide of practice. Surely the neglect of such an indication is a great error, and requires correction. If the eye be inflamed (painful, irritable, red, congested, very sensitive) by exposure to a strong glaring light, or to intense heat, immediately the eyelids are instinctively closed, thus adopting the principle of rest as a means of restoration. There may be a few things in this book that are a little ancient, but if one wants to understand the Worlds War one must study a little ancient history.

There is a point called the reading point, about twelve to sixteen inches distant from the eyes, at which point we read comfortably when the eyes are functioning properly. I find that many of us dentists are viewing our work at a much nearer point. That means that we are bringing into play the ocular muscles which move the eyeball in the act of converging the visual axis of the eyeballs. The continued action of these muscles may bring on eye strain and also may by continued pressure tend to elongate the eyeball and thus produce a condition of myopia. I should like to ask Dr. Wescott at this point if engraver's glasses wouldn't relieve this trouble and

if there would be any harm in their continued use?

We cannot be too careful about washing our hands before bringing them to the eye because it is possible to carry infected material from a decayed tooth to the delicate membranes of the eye. It is possible for me to carry by accident a small quantity of a very strong chemical such as carbolic acid on a finger tip for a few seconds without noticing it. This carried to the eye might do serious damage before it could be washed out.

I know of several cases of a foreign body flying from the field of operation into the dentist's eye. I think it is a good plan to have a saturated solution of boracic acid always in a handy place in the office.

There is a great diversity of opinion between opticians and oculists in regard to the necessity of using drugs such as atropin or homatropin in making an examination of the eye. The optician cannot make a thoro examination without the use of one of these drugs. These drugs dilate the pupil and relax the muscle of accommodation, two things necessary for making a thoro examination. The muscle of accommodation may be in more or less of a spasm from the irritation of straining and may not relax completely when the proper glass is put before the eye. This spasm of muscles is a common occurrence. We see it in fractures and dislocations where the muscles are irritated. In these cases we give anesthetics not only to relieve the pain while we are manipulating the parts, but to relax the muscles so we can manipulate the parts more readily.

The subject of binocular vision has become much more interesting to me since I took up the study of stereoscopic photography. The individual who has the use of one eye only is very much handicapped because he will fail to get the correct perspective afforded to the individual who has the use of both eyes. The difference between monocular and binocular vision might be compared to the difference between viewing a print taken by an ordinary single lens camera and viewing a stereoscopic mount thru the stereoscope. The right eye sees the object at a different angle than the left eye. The right eye sees around the object a little more on the right side than the left eye, and vice versa. This slight difference of the retinal pictures falling on corresponding parts of the retina gives us the idea of perspective.

In regard to illumination, I agree with Dr. Wescott and Dr. Johnson, many dental offices are too well illuminated. At one time there was a disposition to have the furniture in the office painted white and the office enameled white, with a perfect glare of light coming in from the window. That is a great mistake. I should like to ask Dr. Wescott what the advantage is, if any, of the Novial Shade of glass over other colored glass. I have a pair of amber glasses that I slip on in front of my lenses when working with the electric furnace or casting inlays.

I often look sidewise out of my glasses and find toric lenses best adapted to my eyes, because the visual axis is perpendicular to the surface of the lens in whatever direction I rotate the eyeball. With a plain lens I do not look thru the center of the lens; the visual axis is at an angle with the surface of the glass and I get refraction.

Dr. Wescott (*closing*): Unquestionably, if we could have a small window in the upper half of the north wall of our operating room and have the light uniform all day reflected from the northern sky, we would have ideal working conditions not only for operating in the mouth but for operating on the eye. But in Chicago it is impossible for us all to have north windows, and even if it were it would be impossible to have sufficient daylight long enough every day. Of course, it goes without saying that we should never work facing a window.

Many cases of eye strain have been relieved entirely when it was discovered by the oculist that his patient who did not get better and was not happy in his glasses, and the eyes continued to be irritated and inflamed, worked all day facing a window or an electric light.

As to how you can work out the problem of the best artificial light, I cannot say, but as I suggested the illuminating engineers are doing a great deal of excellent work along these lines, and I have here a short paper by Dr. Alger, of New York, entitled "The Relation of Illumination to Visual Efficiency," and another one entitled "The Wearing of Glasses," by Dr. Walter Lancaster, of Harvard University. These are issued by the Journal of the American Medical Association and belong to the series of phamplets on "Conservation of Vision." They cost only a few cents each, and I thought you might be interested.

My office is in the old Field Building, and since the new building has been put up, my window being a south one, I find it practically impossible to detect some foreign bodies in the cornea without the use of artificial illumination. I take my patient to the dark room and use oblique focal illumination and get results immediately. Then I put the patient on my table and use my Nernst lamp and remove the foreign body. While I am on this subject I will say that any of us can have made for ourselves working glasses which will give us any focus which we desire.

For the removal of foreign bodies I use the Berger loop. It is an arrangement of convex spherical lenses with prisms which enable me to work at a focus of five inches from my eyes.

When I operate for cataract, I take off these glasses I am wearing now which give me a reading distance of twenty inches up to twelve. I put on another pair of bifocals in which the lower correction gives me a focus of twelve inches up to eight. My average working distance with this pair of glasses is ten inches, and I can see every detail of the iris and other portions of the anterior part of the eye perfectly. In addition to the increased magnification, I have a little prism to relieve me of the necessity of excessive convergence.

Dr. Johnson spoke of the influence of pyorrhea. We feel that the most serious inflammatory troubles of the eye are more likely to come from closed abscesses than from cases of pyorrhea where there is free drainage; but we do have pain, inflammation, and positive degenerative changes in the eye from pyorrhea, where there are no closed abscesses. Pyorrhea may affect the eyes in two ways: First by the direct toxic action causing more or less destructive inflammation in the choroid and retina and degeneration of the crystalline lens. Second, by a lowering of the general resistance by the constant absorption and toxemia.

Dr. Johnson spoke of a patient who said she was no longer a slave to her glasses, that she could see without glasses more readily after the toxemia was relieved. It was because she had more vigor and more ability to accommodate. She no longer needed as much help as before. Many times we find glasses are necessary to bridge over such conditions as that until the cause of the depression and lowering of general resistance is relieved and the muscle energy is restored.

Dr. Van Tuyl's point in regard to pain in the eye is a valuable one and we should never think lightly of a pain in the eye. It may be due to an irritated tooth or to a foreign body in the eye, or it may be due to something more serious than either of these things, but it should be investigated at once. Pain is a very important indication.

In regard to the Noviol glasses that Dr. Van Tuyl asked about: There is an infinite variety of tinted lenses. In the early days of my work in opthalmology we had the London smoke and the blue lenses, and we had nothing else as a pro-

tecting glass. More recently we have the chlorophyl, which is a green glass; we have the amber, and we have the Crooks' glass of different shades, and the Noviol.

The Crook's glass has a delicate amethyst tint. The chemistry of the glass is such that in spite of the delicate tint, it shuts out the tra-violet and infra-red rays of the spectrum. The Noviol glass gives us the same protection from glare but also has the peculiar quality of bringing out detail in the landscape. It is more conspicuous than the Crook's glass but is a distinct advantage for golfers and shooters, because of bringing out detail. Why that is, I do not know; I have seen no explanation for it. For indoor workers, who are obliged to work in a direct, glaring light I prescribe frequently a Crook's glass because it is not conspicuous.

The theory of the toric lens is that its curvatures is the arc of rotation of the eyeball in its socket. I made the statement that the only way we get the full effect of a lens is by looking thru its optical center at right angles to its plane. In using a toric lens and looking up or down, we do not look thru the center but we do look at right angles to the plane because the plane follows the rotation of the eyeball. That is why the toric lens gives us a larger and clearer field and less strain. The punctal lens is so ground that the slight defects of the toric lens are overcome. It has a parabolic curve towards the periphery which eliminates prismatic and astigmatic effect which we get on looking thru the edge of the flat or toric lens. All patients are not comfortable with toric lenses. People who have worn flat lenses for years sometimes do not take kindly to toric lenses. It takes a long time for some to become accustomed to them. The toric lens for dentists who have to look up in the mouth and have to get into awkward positions many times a day, I should think would be an advantage. As to the size of the bifocal segment: that provided in the kryptok lens, varying from eighteen to twenty-five millimeters, is all that one needs in ordinary work. I can fully appreciate the fact that a wider segment may be desirable for dentists. I would repeat, it is a matter of the individual; your glasses and mine must be made to suit us.

I have been asked to give my opinion as to the difference between north, south, east and west lights. The advantages of north light is that we do not get any direct sunlight from that direction. The north light coming from a northern sky is more uniform. East and west lights change every hour of the day as the sun changes its position in the sky. With west and east windows we get more direct sunlight than we can use. We should have a way of modifying it if we must work under those conditions. An ideal arrangement would be that described by Dr. Johnson, with window in the upper half of the north wall, if possible. The next best is the east, and the worst is the south.

If there are no other questions to be answered, I wish to thank you again for your kind attention.

On Motion of C. N. Johnson, a vote of thanks was extended to Dr. Wescott for his interesting and instructive paper.

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VOL. 6 JANUARY, 1919 No. 1

Editorial Department.

THE DENTAL PROFESSION'S TEN AIMS FOR THE NEW YEAR 1919.

1. 27,000 members and 32,000 subscribers to The Journal.—Fifteen per cent increase in membership in every state society.

2. $75,000 in the Relief Fund.—Debt on the Research Institute building paid. —The foundation for a great National Dental Association Library laid.

3. 3,000 members in attendance at New Orleans meeting.

4. Due respect and honor for members of the dental profession who have served their country during the war.

5. Permanent Army and Navy Dental Schools established.

6. Systematic and standardized graduate and post-graduate courses inaugurated and developed.—The educational standard in every dental school raised.—The classification of State Dental Examining Boards.

7. More efficient dental service to humanity and better plans for educating the public.

8. Less of the spectacular and more of the scientific.—Greater thrift and a better educating individual dentist.

9. The three requisites for the successful dentist: Enthusiasm, Energy and Thoroness.

10. For every dentist to have a religion of truth, law, justice, work, democracy, mercy, monogamy, science, and God.

THE VICTORY OF THE OLD YEAR AND OUR VISION OF THE NEW

The year 1918 has gone; the year which will ever, in the history of mankind, stand out in bold relief as a world statue of liberty, registering the termination of the most cruel war in the annals of the human race; the year which marks the end, we hope for all time, of man's destruction of man; the year which will record the triumph of universal brotherhood based on service and sacrifice and victory for defenders of liberty. The year 1918 will chronicle the birth of a new world democracy.

The year 1919 is the first in five years that cruel war has not rocked this old world; the fighting is over; official peace is in sight. This year will see a steady stream of our boys returning home. The members of the dental profession have worked hard during this war in rendering patriotic service as enlisted men and as civilians. However, there is now facing each one of us a tremendous responsibility, as citizens and as professional men—to conserve and maintain for future generations the lessons learned in this cruel war at the sacrifice of a quarter of a million of our own boys' lives. In this great battle against a "let-down" in citizenship, against disease and for a continued effort for high professional standards, there must be no armistice; no peace without victory.

No individual, society, state or nation will ever make real, substantial growth and progress without a definite aim or program. The "TEN AIMS FOR THE NEW YEAR" listed above should be the star to which every dentist, and officer should hitch his wagon for 1919, and also every society.

Here's wishing to every member of our great Journal family the courage, self-confidence, enthusiasm and determination for a successful and happy New Year.

THE DENTAL REVIEW SUSPENDS.

With the December issue The Dental Review suspended publication.

During thirty-two years this dental journal has blazed an original pathway, and has been a beacon light for the advancement of the highest and best interest of the dental profession.

A review of dental literature will reveal the fact that in the culmination of modern dentistry, The Dental Review has played a most significant part.

The Publishers, H. D. Justi & Son, who "have spared no pains or expense to keep the magazine in the foremost ranks of dental journalism," should feel proud of the noble work which they have so successfully accomplished,—assisting in advancing dentistry from its infancy to a great scientific profession.

However, the real success after all of any great undertaking depends on the man at the helm. He is the compass and captain.

Dr. C. N. Johnson, the eminent educator, scholar, poet and author, has been for sixteen years the editor and the guiding spirit of The Dental Review. Dr. Johnson is recognized, wherever modern dentistry is known, as one of our few great men. He has coupled with all his versatility of accomplishments a noble, sweet spirit of unselfish devotion to the best interests of the individual dentist, and the progress of dentistry. Dr. Johnson is a natural born writer, and he will continue to do efficient work for the uplift and advancement of dentistry.

SUCCESS OF THE SALE OF CHRISTMAS STAMPS.

Over 12,000 dentists and others have nobly responded to the appeal for the Relief Fund, thru the sale of the Christmas seals. However, there are a few who, thru neglect, oversight or otherwise, have not contributed to this worthy cause.

$53,000 is a very large sum and while this aim may seem beyond attainment for this year, yet if every dentist will make a small sacrifice of only $1.00, we shall reach our goal. Then the Relief Fund Committee will be in a position to outline to the Board of Trustees and the House of Delegates of the National Dental Association definite plans for the administration and distribution of financial help to our indigent members. A careful permanent Relief Fund Ledger is being kept in the office of the National Dental Association. This ledger records the individual contribution of every donor to this fund. The funds are now invested in Liberty Loan Bonds. The Trustees of the National Dental Association

realize the tremendous responsibility involved upon them in the careful investment of these funds and every contributor may rest assured that this sacred obligation and responsibility will never be violated but that the funds will always be safe-guarded and no investment made without the advice of the best bankers in the country.

If you have not already sent in your check, kindly do so immediately as it will save the National office time and expense in writing you a personal letter.

MILITARY PLASTIC AND ORAL SURGERY.

One of the developments of the war of importance to dentistry was the organization of the Division of Plastic and Oral Surgery by Surgeon-General Gorgas. This Division consists of an equal number of surgeons and "dental oral surgeons," who have worked in teams, one team being assigned to each base hospital in the United States and overseas. The creation of this Division is amply justified by the appearance of hundreds of articles in the current literature of surgery and dentistry upon this particular field of work; in fact, this field is rapidly developing a literature of its own. In war, the injuries involving the mouth usually require not only the ordinary surgical care, which would result in healing of the parts, but also special consideration to obtain the best masticatory apparatus and the minimum disfigurement of the face. As the percentage of face injuries has been large, so has the need of special treatment by plastic surgeon and dental surgeon been very important. The fields of the dentist and surgeon have thus been closely interwoven and they will not be again separated.

There appears in this issue of The Journal the first installment of lectures on Military Plastic and Oral Surgery, by Dr. Carl E. Black, delivered before an Officers' School of Plastic and Oral Surgery. These lectures present the most up-to-date summary of war Surgical conditions in general and of oral surgery in particular that has come to our attention and we venture the prediction that they will claim the attention of military surgeons thruout the world. In connection with the lectures an extensive bibliography is published. The articles are grouped under thirty-five headings, a review of which (in the current paper) will give one a fair idea of the wide scope of the field of the plastic and oral surgeon. These lectures are accompanied by numerous illustrations, several of them in colors.

About two hundred dentists represent the profession in this service. They were specially selected and all reports indicate that they are carrying well the great responsibility which was placed upon them.

1919 MEMBERSHIP DUES, INCLUDING JOURNAL SUBSCRIPTION, DUE JANUARY 1.

All National Dental Association dues, which include the annual subscription to The Journal of the National Dental Association, are due January 1 of each year. The February Journal will not be mailed to any delinquent members. The ruling of the War Industries Board and the postoffice authorities are adamant on this proposition. Therefore, any dentist who has not already paid his state society dues for 1919 should do so immediately. The state society officers are cooperating with the National organization and will immediately upon receipt of the state dues mail the National dues to the National office.

Those who have not paid their 1919 dues should heed this warning for it will be impossible for The Journal office to furnish back copies for, in complying with the War Industries Board's instruction, we are printing only enough copies to supply our bona fide mailing list. An immediate compliance with this notice will save the delinquent member a great deal of confusion and misunderstanding.

Have you returned your Check for Christmas stamps?

SPECIAL ANNOUNCEMENT REGARDING TRANSACTIONS AND INDEX.

The completed transactions of the 1918 meeting of the National Dental Association will be published in book form in paper cover. A copy of these transactions will be sent to anyone upon receipt of fifty cents in stamps, if the order is received prior to January 25.

The annual index to the 1918 volume of The Journal will be published in pamphlet form and sent gratuitously to anyone. No charge will be made for this index but orders should be sent immediately to the National Dental Association, 127 North Dearborn St., Chicago, Illinois.

THE ALLIED DENTAL JOURNAL WILL SUSPEND.

As we go to press, we have been reliably informed that The Allied Dental Journal will soon suspend publication.

Fifty-three Thousand Dollars from sale of Christmas stamps. Have you sent your Check?

Relief Fund Department

The permanent Relief Fund Ledger records the individual subscription for the 1918 Christmas Relief Stamps from nearly 13,000 members and others. The bookkeepers will soon be able to balance all sales and those who have neglected to reply either by the return of the stamps or checks, will receive another letter addressed to delinquents.

If you have not already sent in your check, kindly do so immediately as it will save the National office time and expense in writing you a personal letter.

Thousands of letters have been received commending this noble work, and we are pleased to publish excerpts from a few of these. The reading of these letters makes one rejoice at the magnanimous spirit manifested by the dental profession for its indigent members.

Have you contributed?—Editor.

My Dear Doctor King:—

Enclose check for $26.00, twenty-five of which completes my five payments or the $125.00. This, with the expense of sending out circulars over this western country, stenographic work, printing and postage, which ran over another $125.00, makes over $250.00. I am not aware of ever contributing to a cause which gives me more happiness and pleasure, for with the splendid work you are doing in The Journal, surely it is only a question of time until The Relief Fund will be of sufficient size to enable the Association to help those in need.

Most sincerely,

W. T. CHAMBERS,
Denver, Colo.

* * *

Dear Doctor:—

I am enclosing my check for one dollar, and with pleasure.

GEO. B. LITTLE,
Palo Alto, Calif.

Dear Doctor King:—

Enclosed please find check for National Relief Fund for Dr. James H. Howell. Dr. Howell is serving with American Forces over in Russia at present.

Yours truly,

MRS. ELSA M. HOWELL,
Detroit, Mich.

* * *

Dear Sir:—

We enclose check on the Girard National Bank for $50.00 as contribution toward the National Relief Fund.

Yours very truly,

THE S. S. WHITE DENTAL MFG. CO.

* * *

Dear Doctor King:—

Enclosed find check for $1 in payment of my share of the National Relief Fund. I thank you for the opportunity to help in the great reconstruction work.

Sincerely yours,

MOSES EISENBERG,
Roxbury, Mass.

Dear Sir:—

I am returning to you the Christmas seals you sent Doctor. I am indeed very sorry to do so, but I do not feel that I can spare the money.

Doctor is in the U. S. service overseas, and the children and I are on a limited amount of money.

I hope Doctor will return home. By next Christmas perhaps we can make up for what we could not do this year.

Yours truly,
MRS. —— ————

* * *

Gentlemen:—

Herewith hand you my personal check in the sum of $2.00 for the Relief Stamps sent to the writer and Dr. H. A. Wells, who is in the Base Hospital, Camp Dodge, Iowa, as a private.

Glad to help the good work along, and do this to help in a very small way a good cause.

Yours truly,
HERBERT F. STEVENS,
Aberdeen, S. D.

* * *

Dear Doctor King:—

Enclosed you will find my personal check for $1.00 for the stamps you sent to Dr. Wodie. Dr. Wodie has been in France a year, but I felt he would want to do his part in your work.

Very sincerely,
MRS. C. R. WODIE,
Madison, Wisc.

* * *

Dear Doctor:—

It gives me great pleasure to enclose herewith my check for $1.00 to help in the Relief work which will ever stand out as a monument to the Dental Profession of our beloved country, in the care of and for those unfortunate of us who are unable to care for themselves.

With best wishes to the banner year of the fund, I am

Fraternally,
GEO. T. GURR,
Columbus, Ga.

Dear Doctor King:—

I gladly send check of $1.00. If more is needed let me know. Always ready to do my share.

Yours very truly,
DAVID McLAIN,
Jamestown, N. D.

* * *

Dear Doctor:—

Wishing you abundant success in this undertaking, I beg to remain,

Fraternally yours,
LIEUT. A. F. GROEBNER,
Base Hospital, Ft. Sill, Okla.

* * *

Gentlemen:—

Dr. T. E. Bailie, from a letter received from him written Nov. 19th at Verdun, France, was well, and happy over the armistice.

It gives me great pleasure to send a check for the stamps.

HIS MOTHER,
Yakima, Wash.

* * *

Dear Sir:—

I assure you this is an annual pleasure and I wish you the greatest success.

Yours respectfully,
J. W. WELCH,
Fairport, N. Y.

* * *

Gentlemen:—

I am enclosing a check for one dollar for the Relief Fund and am glad to once more make an annual contribution to such a worthy cause. Keep up the good work.

Very truly yours,
H. C. DRESSEL,
Silver Lake, Minn.

* * *

Dear Doctor:—

As Dr. O'Mara is in France, and I have the pleasure to attend to his mail while he is abroad, I take pleasure in mailing his check for $1.00 to your worthy cause.

Very respectfully,
MRS. M. J. O'MARA,
New Haven, Conn.

Dear Doctor King:—

It gives me genuine pleasure to contribute to such a worthy cause.

Yours very truly,

ERNEST ELMEN,
Sioux City, S. D.

* * *

Dear Doctor:—

This is certainly a fine work you are doing and should be pushed to the limit.

Fraternally yours,

C. L. SMITH,
Loudonville, O.

* * *

Dear Doctor:—

I wish you success in your noble undertaking,

M. ECKER, New York.

* * *

Dear Doctor:—

Kindly accept this for the seals received. Am certainly glad to hear that our profession is always "on the job."

Respectfully,

LIEUT. E. E. LORENZ,
Houston, Texas.

* * *

Dear Sir:—

In behalf of my son, Dr. Harold Neville, who is in the U. S. service, I will enclose a check for $1.00 for the Christmas seals.

Yours truly,

MRS. J. L. NEVILLE,
Hildreth, Nebr.

* * *

Dear Doctor King:—

Here's $5.00 to the Relief Fund, and may I be able to double my little bit each year for the next fifteen years.

Respectfully,

EDWARD M. HALL,
Kansas City, Mo.

* * *

Dear Doctor:—

It gives me great pleasure to enclose my check for $1.00 for this good and worthy cause.

With best wishes, I am

M. O. FRASER,
Lincoln, Nebr.

Dear Sir:—

Enclosed find one dollar, you know what for. Would it were fifty.

Respectfully,

A. B. DUNFORD,
Salt Lake City, Utah.

* * *

Dear Sirs:—

Surely this is the least we can do for the men of our profession.

Yours truly,

C. L. BONSTELL,
Arcata, Calif.

* * *

Dear Doctor:—

Dr. Wm. D. Jones has been in the service at Fort Oglethorpe since June. I send you $1.00 for him to apply to the Relief Fund.

HIS MOTHER, Utica, N. Y.

* * *

Dear Doctor King:—

Please find enclosed my check for $2.00 to cover the Christmas seals you sent to me and also to my associate, Dr. C. Franklin MacDonald, in whose name I gladly buy them.

Dr. MacDonald has been in France for eighteen months and I am sure if he were here, he would wish to make his contribution.

Wishing you a Merry Christmas, I am

Sincerely yours,

WM. B. DUNNING,
New York.

* * *

Dear Sir:—

Thanks for calling my attention. Glad to contribute this little for such a noble cause.

Yours very truly,

J. H. IHRIE, Wendell, N. C.

* * *

Dear Doctor:—

Please find enclosed one dollar for Christmas seals. I appreciate the fact that we are remembered in this matter.

Fraternally yours,

A. N. LAWRASON,
Quincy, Mich.

Gentlemen:—

Dr. L. C. Wilson is in the service and has been since last July. I, as the Doctor's father, am glad to send you my check for the Christmas seals in his stead.

Wishing you the best of success, I am

Yours very truly,

C. J. WILSON,
Union, Iowa.

* * *

Dear Doctor:—

I thank you for permitting me to become a part of this splendid movement.

Very truly yours,

IRVIN MILLER,
Shreveport, La.

* * *

Dear Doctor King:—

My son, Dr. M. B. Bevier, is still in France, having been on the front since March. The last we heard of him he was in a hospital gassed, but getting along nicely.

Enclosed find $1.00, which I send for him. Wishing you lots of success, I am

Yours truly,

H. B. BEVIER.

* * *

Dear Doctor:—

Enclosed find check for one dollar. I am only too glad to give this little help toward the worthy cause. Let the good work go on.

Very respectfully,

C. J. REYNOLDS,
Pittsburgh, Pa.

* * *

Dear Doctor King:—

It gives me great pleasure to assist such a worthy cause.

Yours truly,

A. W. GUSE,
Bryant, S. D.

* * *

Gentlemen:—

Mighty glad to remit to such a worthy cause.

Yours fraternally,

GEO. W. BRACE, Erie, Pa.

Dear Doctor King:—

It gives me pleasure, as usual, to respond to the Relief Fund. I am one of those who contributes $1.00 thru the State Association each year. I do not consider it any hardship to add another $1.00 to that most worthy aspiration of the Dental Profession.

There is something pathetic about "Unprovided for old age" and since nine men out of every ten are likely to reach that condition, it behooves every young man to encourage the movement all he can.

HENRY W. MORGAN,
Nashville, Tenn.

* * *

Dear Doctor:—

I sincerely hope that there are no "slackers" among our great Fraternity, and that you reach the grand total.

Fraternally yours,

C. C. CHESTERSON,
St. Louis, Mo.

* * *

Dear Doctor King:—

I am glad to send the amount which I think is small for so worthy a cause.

Yours fraternally,

L. H. MOORE,
Appleton, Wisc.

* * *

Dear Doctor King:—

I am glad to help in so worthy a cause. Wish I could do more.

Yours fraternally,

R. H. HOVEY,
Washington, D. C.

* * *

Gentlemen:—

This fund is tremendously useful in itself, and finds me more than willing to contribute to it, a procedure I earnestly hope to continue as time runs on.

Fraternally yours,

LIEUT. M. E. WALTON,
Camp Sherman, O.

* * *

Dear Doctor:—

With pleasure.

A. J. PRICE, Gulfport, Miss.

My Dear Doctor King:—

Inclosed please find check for $1.00 to pay for those Christmas seals you so kindly sent me and am glad to be able to respond to this noble cause.

Fraternally yours,
WM. A. SQUIRES,
Camp Sheridan, Ala.

* * *

Dear Sir:—

I thank you for the opportunity given me to contribute to such a noble cause.

Yours truly,
CHAS. G. SAMUELS,
Camp Kearny, Calif.

* * *

Dear Doctor King:—

Glad that I can contribute even in this small way to this good work.

A profession that has done themselves so proud in the great world conflict is one that I am sincerely and truly glad that I am a member of.

Cordially and fraternally yours,
LEWIS E. HAY,
Wheatland, Wyo.

* * *

Dear Sir:—

I hope every man will be prompt and that we go over the top before Christmas.

Fraternally,
H. E. BARTLE,
Lakeville, Conn.

* * *

Dear Doctor King:—

I hope every dentist in the country will respond promptly so that you will have your total of $53,000 before Christmas.

Fraternally yours,
F. C. KEMPLE,
Newark, N. J.

Dear Doctor:—

It is a worthy cause, and I wish you success.

Yours fraternally,
S. E. LINDLEY,
Sullivan, Ind.

* * *

Gentlemen:—

I am greatly pleased to enclose my check for $1.00 for the Christmas seals,

Wishing you success in your fine work, I am

Fraternally yours,
HARRY F. LOTZ,
Joliet, Ill.

* * *

Dear Sir:—

I am glad to send this mite to help the old pioneers who have blazed the way for the rest of us.

Yours fraternally,
J. A. BLUE,
Birmingham, Ala.

* * *

Dear Brothers:—

Enclosed please find my bit, $1.00, for stamps. Happy indeed to do it. Don't forget me another year.

Fraternally yours,
E. A. BRICKERS,
Green River, Utah.

* * *

Dear Doctor:—

Pardon delay in sending our check. There was illness in the family and the letter was pushed aside. Doctor is in the service and we are most happy to add our mite to the fund.

Very sincerely,
MRS. W. J. CRYDERMANN.

Thousands have returned their Check for Christmas stamps. Have you?

Army and Navy

ARMY MEDICAL CORPS.

Representative Dyer proposes in H. R. 13344 to amend the national defense act, as follows:

That the medical department of the Army shall consist of one surgeon general with the rank of major general, who shall be chief of said department; assistant surgeon generals in the ratio of one-half of one per centum of the total number of officers of the medical department provided by law, the assistant surgeon generals to be equally distributed in the grades of major general and brigadier general of the medical corps, the dental corps, and the veterinary corps authorized by law, the commissioned officers of which shall be citizens of the United States the enlisted force of the medical department of the Army as now provided by law.

Sec. 2. That commissioned officers of the medical corps below the rank of brigadier general shall be proportionately distributed in the several grades as now provided by law for the medical corps of the Navy.

Sec. 3. That hereafter the President shall be authorized to fill any vacancy that may occur in the commissioned personnel of the permanent establishment of the medical department of the Army of the United States by selection from the medical officers of the United States Army of not less than one year's continuous active service; Provided, That the selection shall be upon the efficiency rating and satisfactory examination of the officer, and where two or more officers are of equal rating selection will favor the one of the longest service in the United States Army, Volunteer Army, National Guard, officers' reserve corps or National Army: Provided further, That the officers so selected will be commissioned without loss of rank in the permanent establishment of the medical department of the Army of the United States, and such officers so commissioned shall be entitled to all pay, promotion, and allowances of officers of like rank in the permanent establishment of the Army of the United States, excepting that the rate of retirement pay, shall be one-thirteenth of the present retirement pay, as now prescribed by law, for each year's service as enlisted man; or commissioned officer, or the total of such services in the United States Army, Volunteer Army, National Guard, officers' reserve corps, National Army, dental corps, dental reserve, or enlisted personnel in the Army or National Guard in any of the various departments of the Army of the United States: And provided further, That at the age now prescribed by law for retirement an officer to receive retirement pay shall have not less than 15 years' service in any or all branches enumerated in this act: And provided further, That the provisions of this act shall in like manner govern the filling hereafter of all vacancies in the dental corps of the United States Army: And provided fur-

ther, That the ratio of dental surgeons now and hereafter commissioned shall be two dental surgeons per thousand of enlisted strength of the Army of the United States: And provided further, That all laws or parts of laws, in so far as they are inconsistent with the provisions of this act, are hereby repealed. — *Army and Navy Register.*

THE NATIONAL BOARD OF MEDICAL EXAMINERS.

During the past two weeks the National Board of Medical Examiners[1] held its sixth examination, conducting it simultaneously in New York and Chicago. In Chicago, out of fifty-eight who applied mostly interns in hospitals—only thirteen appeared to take the examination. The explanation is that these interns could not leave their hospital duties for the time required, and that substitutes for the hospital duties could not be obtained. That so few recent graduates in medicine avail themselves of the privilege of taking this examination is surprising, since in after years the National Board's certificate is sure to mean much to them. This certificate has already received recognition, either by board ruling or by amendments to the medical practice acts, in eleven states;[2] and in several others, efforts to amend the practice acts will soon be made. The holder of this certificate is eligible for the Medical Corps of the United States Army and the United States Navy, subject only to his passing the required physical examination. As a result of the war there is bound to be a closer union between the medical men of the Allied nations, making it probable that in time this certificate will receive recognition in foreign countries. Even now, the National Board is planning to make a trip to France, where the examination of a number of American physicians can be witnessed by representatives of England, France and Italy, with the hope that, based on the certificate of this board, reciprocity in medical practice can be arranged with those countries. The certificate already stands as a badge of merit to its possessor. Up to, but not including, the present examination, the board has examined ninety-three applicants, of whom seventy-two passed and twenty-one (22.6 per cent.) failed. This high percentage of failures shows at once the thoro character of the examination. For, considering the fact that only graduates of Class A medical schools are admitted to the examination, this percentage of failures is high. Applicants must also have completed an internship in a hospital.— *Editorial in A. M. A. Journal.*

1. A descriptive statement regarding this board is contained in the Report of the Council on Medical Education to the House of Delegates of the American Medical Association. See The Journal, June 15, 1918, p. 1946.

2. These states are Colorado, Delaware, Idaho, Kentucky, Maryland, New Hampshire, North Carolina, North Dakota, Pennsylvania, Rhode Island and Vermont.

PROMOTION OF ARMY OFFICERS.

Secretary Baker said on Wednesday that the War Department is pursuing a fixed policy in denying all promotion to officers who are on active service. The blanket order of November 11, cutting off promotion both in the home forces and overseas, he indicated, will not be modified, and the only way in which officers who have been recommended for promotion can attain the advanced rank is thru the inactive list of the officers' reserve corps.

Mr. Baker said the department was proceeding on the theory that with demobilization a great many captains, majors and officers of higher rank would be left unassigned. It is regarded as wholly unnecessary from the point of view of the department, he indicated, that any additional officers in higher grade be created, as the available supply of officers

in any grade will more than meet all demands.

There is no desire, however, to cut deserving men off from the honor that goes with promotion, he said, and officers who were recommended for advancement before hostilities ceased will be taken care of as they enter the reserve corps on discharge from their present commissions. Each will be placed on the inactive list of the reserve in the advanced grade to which he had been recommended.—*Army and Navy Register, Dec. 21.*

FIGHT OVER ARMY NOMINATION.

The nomination of Lieut. Col. Robert E. Noble, of the Army medical corps, (temporary major general) to be a permanent brigadier general in the medical department, submitted to the Senate on December 3, is not likely, from present indications, to be favorably reported from the Senate military committee or confirmed by the Senate before the adjournment of this Congress on March 4. The other medical corps nomination, that of Col. Walter D. McCaw to be a permanent brigadier general, fills the remaining vacancy in that grade in the medical corps. The opposition is confined to the former nomination on the ground that General Noble is a junior member of his corps and will "jump" some 100 seniors if he is made permanent brigadier general. The case aroused the interest of several members of the military committee and resulted in an investigation of the circumstances which attended this nomination. It appeared that the recommendation of the surgeon general of the Army and that of the chief of staff of the Army for appointment to these positions named Colonel McCaw and Colonel (temporary brigadier general) Jefferson R. Kean; that these recommendations were changed by Assistant Secretary Keppel so as to substitute General Noble's name for that of General Kean; that Secretary Baker approved the revision. In the meantime other senators, who are not members of the Senate military committee, have interested themselves in the situation, including Senators Martin and Swanson, of Virginia, so that there is every prospect that the Noble nomination will expire with the adjournment of this Congress. The other pending Army nominations have been held up for the present, largely at the instance of Senator McKellar, of Tennessee, member of the military committee, who has been specially interested in an active supporter of, the Noble nomination. But it is not apprehended that there will be more than a temporary delay in acting on the nomination, to which there is no objection. The senators who took exception to the appointment of General Noble regard it as akin to that of Rear Admiral Grayson of the naval medical corps, where the overslaughing of seniors was more aggravated, but where success attended the nomination despite pointed senatorial opposition because the President made the confirmation a personal matter and notified senators that the rejection of the nomination would be equivalent to an affront to him. No such factor enters into the Noble nomination as an aid to senatorial approval of it, however.—*Army and Navy Register, Dec. 21.*

OFFICERS RECOMMENDED FOR PROMOTION.

Senator Kendrick has introduced a bill (S. 5190) to grant recommended promotions to officers and men of the Army, as follows:

That all officers and enlisted men of the National Guard, of the Medical Reserve Corps of the Army, of the National Army, and of the Regular Army who entered the military service for the present emergency, and who, because of demonstrated fitness in actual service, had been recommended for promotion by their duly qualified superior prior to November eleventh, nineteen hundred and

eighteen, shall, if honorably discharged prior to the signing of a treaty of peace between the Government of the United States of America and the Governments of Germany and Austria-Hungary, be discharged in the rank to which they had been recommended: Provided, that nothing in this Act shall be construed to prevent the promotion of any officer or enlisted man who, in the judgment of the Secretary of War, should have higher rank than that to which recommended: Provided further, That the benefits of this Act shall not extend to any officer or enlisted man who, in the judgment of the Secretary of War, is not entitled to the recommended promotion.—*Army and Navy Register, Dec. 21.*

PERMANENT NAVAL ENLISTED FORCE.

Draft of bill submitted by the Bureau of Navigation; An Act establishing the permanent enlisted strength of the Navy.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

That from and after the date of approval of this Act the authorized permanent enlisted strength of the Navy shall be one hundred seventy-five thousand men, plus twenty-four thousand apprentice sea men and firemen under training, plus six thousand men for aviation service in the Naval Flying Corps, but excluding Hospital Corps men, men undergoing sentence of court martial, and men sentenced to discharge by Court Martial. —*Army and Navy Register, Dec. 21.*

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

Future Work of the League.

Altho organized as a war emergency measure, conditions have so changed that there is a definite call for the League in a broader and more embracing sense. In fact, those who rightly read the signs of the times are united in the belief that the fullest usefulness of the organization is yet to come.

The identity of the League will, no doubt, be absorbed by the broader conception and we will be big enough to take up service for our profession thruout the allied nations. Should not the dentists of the United States and Canada, who have in reality gained greatly by the war, give every possible assistance to our brothers who have suffered loss of practice, home, money and even worse? Is there not a call to you thru professional sympathy and the brotherhood of man to come forward in this, their hour of darkness and need and stretch forth a helping hand? Can you compute the wonderful influence thereby exerted toward establishing bonds that will live for all time?

Let us see the vision and act without delay. Let us keep alive the great principle upon which the League was founded and which has made it so great a power for good. Our National Dental Association needs such an organization to forward public service work in its name and to do such service for the welfare of the people as cannot be accomplished by a society whose activities are purely scientific in character. We must remember that the old order of things has been completely changed by the conditions beyond our control, therefore, let us quickly adjust ourselves accordingly and meet these new conditions as we have so successfully met everything thus far.

Before this message shall have reached you, it is the hope of the officers of the League that this matter shall have crystallized and definite plans have been formed. We wish to call your attention to the excellent editorial in the December Cosmos which should be read by every member of the League. The outline of our future possibilities so well stated by him should receive careful consideration from the profession and

any suggestions will be gladly received at League Headquarters.

The above is merely a suggestion of one of our future activities but there are others of local as well as general significance to be considered which will make the League more useful than ever.

Our Home Service Work.

Director-General Tracy has sent a letter to all State Directors to co-operate with the Home Service Section of the Red Cross in caring for the families of soldiers and sailors in need of dental treatment. All members of the League are requested to take up this splendid work and by communicating with your State Director you will be given necessary instructions. Let us make a record that we will be proud of.

Send in Reports.

All our members are earnestly requested to send in all reports of free dental service to the New York Headquarters. Hundreds of thousands of such operations have not been reported.

How many have you failed to report?

Lantern Slides.

Those holding one or more sets of the lantern slides sent out from Headquarters last winter, will kindly communicate with the President and state whether it is desired to retain them or return them.

Our Course of Instruction.

Before this message reaches our members, a splendid course of instruction will have been given jointly by the Royal College of Dental Surgeons at Toronto, and the League.

The week of December 16th to 21st was given over to an intensive course at the Royal College, the instructors being, Major W. E. Cummer and Colonel Guy Hume, representing Canada. Dr. LeRoy Miner, Boston, and Dr. Arthur Smith, Chicago, representing the League and the profession of the United States. The class was limited to one hundred and was made up of a very representative number of our dentists. The fact that Canada now has a great amount of clinical material in the War Oral Surgery and prosthesis which was available for this course thru the courtesy of Colonel W. H. Thompson, in charge of the Dental Reserve Corps of Canada, has made it the most notable and valuable course yet given for the civilian practitioner. Similar courses will be given in principal cities of the country as rapidly as arrangements can be made.

Inquiries directed to the President of the League, 131 Allen Street, Buffalo, N. Y., will receive prompt attention.

J. W. BEACH, President.

DENTAL CORPS ORDERS FROM WAR DEPARTMENT.

DENTAL CORPS.

Maj. Earl C. Braniger, Fort Des Moines, Iowa, to duty with base hospital 144.

The following to camps for duty as camp dental surgeons: Majs. Eugene Milburn, Camp Cody, N. M.; Harry C. Peavey, Camp Hancock, Ga.; Charles Taintor, Camp Bowie, Tex.; Robert B. Tobias, Camp Greene, N. C., and Lowell B. Wright, Camp Funston, Kan.

Maj. Shirley W. Bowles, to Detroit, Mich., General Hospital 36, for duty.

Maj. Walter L. Reesman to western department for duty.

Maj. Emmett P. Varvel to Fort Des Moines, Iowa, general hospital 26, for duty.

Maj. Oscar G. Skelton to Washington, D. C., for duty in office of attending surgeon.

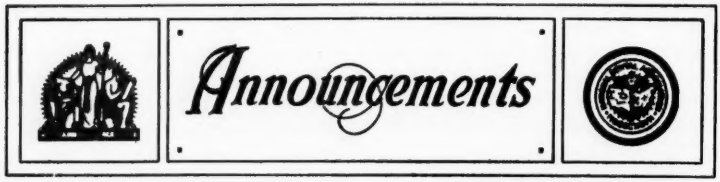
"1st Lt. William E. Ross, D. C., promoted to Major with rank from August 22, 1918."

The following now on duty with division of purchase and storage placed on unassigned list of medical department and assigned for duty under direction of director of purchase and storage, purchase, storage and traffic division, general staff, stations and duties to remain as at present, credit to be given the medical department on its unassigned list for officers so transferred:

Lieutenant Colonels—J. R. Bernheim and Albert R. White.

Major—J. C. King.

—*Army and Navy Register.*



NATIONAL SOCIETIES, 1919.

October.

20-24—New Orleans, National Dental Association.

20-24—New Orleans, National Association of Dental Faculties.

20-24—New Orleans, National Association of Dental Examiners.

20—New Orleans, Delta Sigma Delta.

20-24—New Orleans, Xi Psi Phi Fraternity.

20-24—New Orleans, Association of Military Dental Surgeons.

STATE SOCIETIES.

January.

10—Hawaiian Islands, Honolulu.
13—Alaska, Cordova.

February.

6-7-8—Minnesota, St. Paul.

March.

19-20-21—Vermont, Burlington.

April.

7-8-9-10-11—Alabama, Birmingham.
7-8-9-10-11-12—Michigan, Detroit.
9-10-11—West Virginia, Wheeling.
14-15-16—Missouri, St. Louis.
14-15-16—Kansas, Topeka.
15-16-17—Connecticut, Hartford.
15-17—Mississippi, Clarksdale.
20-30-May 1—Pennsylvania, Pittsburgh.
21-24—Texas, Waco.

May.

6-7-8—Iowa, Des Moines.
7-8-9—Massachusetts, Boston.
13-14-15-16—Illinois, Peoria.
19—Arkansas, Pine Bluff.
20-21-22-23—Indiana, Indianapolis.
20-21-22—Nebraska, Omaha.
California Southern, Los Angeles.
North Dakota, Fargo.
South Dakota, Mitchell.

June.

9-10-11-12—Kentucky, Louisville.
11-12-13—Georgia, Savannah.
12-13—New York—Syracuse.
18-19-20—Florida, Tampa.
18-19-20—New Hampshire, Manchester.
19-20-21—Colorado.
Maine. Place to be announced.
Maryland, Baltimore.
South Carolina, Columbia.
Utah, Ogden.

July.

8-9-10—Wisconsin, Milwaukee.
24-25-26—Montana, Butte.
New Jersey. Place to be announced.

October.

21—Louisiana, New Orleans.
Rhode Island, Providence.

December.

2-3-4—Ohio.

DATES TO BE ANNOUNCED.

Arizona, Phoenix.
California State, San Francisco.
New Mexico, Albuquerque.
North Carolina, Asheville.
Oklahoma.
Tennessee, Nashville.
Virginia, Richmond.
Washington, Seattle.

NATIONAL DENTAL ASSOCIATION 1919 SESSION.

New Orleans, La., October 20-21-22-23.

Special Message from Local Committee.

Dentists of America — 'TEN-SHUN! Right dress! Fron-n-n-nt! At ease! Res-s-s-st

You will now listen to a brief message from Major C. V. Vignes, Dental Corps, U. S. Army. The major—

Wait a minute gentlemen. Your pardon. That's wrong. It would have been right a few days ago. But today Major Vignes is just plain C. V. Vignes, D. D. S., president of your national organization, back again in civilian life, practicing his profession—and yours—in New Orleans.

So, talking as one dentist to another, he wants to let you know that even tho you're not due in New Orleans until October, 1919, still the ancient city is mapping out plans for your reception just as if you were coming to drop in for the next week-end. That's a way New Orleans has with her guests, he wants you to understand.

And here's his message:

Whatever your plans may be for 1919 —make sure that they include attending that convention in New Orleans in October.

It will be more than an ordinary national convention.

It will be more, even, than a national convention in a city that proudly counts among its citizens more dentists than any other city in the South.

It will be a convention where you'll get more, even, than the benefit of mingling with the best dentists of America—which is to say the best dentists in the World.

It will be a convention in a city that is looking ahead and planning to make your visit in October, 1919, one that you'll remember thru every one of the years to come—and that has the facilities to do it.

Some of you have been in New Orleans before. You know!

For those who haven't, here is the briefest of sketches of what awaits you:

Do you like comfortable quarters—uncrowded—when you attend a national convention? New Orleans, thru the experience of years of Mardi Gras throngs, can house in her hotels nearly 50,000 visitors at once—without resorting to cots, in the hall or blankets on the billiard table. Those hotels can give you anything offered by any hotel in the world in comfort, in quiet and in luxury. And their rates are human.

Do you like the best cuisine in the world? New Orleans has it, at her world-famous restaurants with world-famous chefs,—chefs that in some cases have been five generations in the kitchen. Do you know the joys of oysters Rockefeller, of planked pompano, of gumbo Creole, of crawfish bisque, of jambalaya, of dripped coffee? They're waiting your arrival.

Do you like picturesque scenes—sites immortalized in a history that goes back unbroken for two centuries? Here it is, unchanged, before your eyes as men now dead for generations once looked upon it—men who made that history you have read.

For, while "across Canal Street" the "American City" offers skyscrapers and garden districts of beautiful residences, rose-embowered all the year round, the Old French Town yields sights no visitor ever forgets.

Here, in October, 1919, you'll see the historic Place d'Armes, where the Casket Girls of France's Louis landed, where landed the exile Acadians, where Jackson marched forth to the Battle of New Orleans. You'll see the St. Louis Cathedral, where he celebrated victory; the Chalmette Battlefield, where he won the renoun that led to the White House; the Cabildo, in whose stone-flagged rooms the

Province of Louisiana was transferred to the United States; Don Alexandro O'Reilley's headquarters, where the picturesque and blood-thirsty Spanish captain-general ruled in his Reign of Terror in 1700; the house built to receive Napoleon, when he was to have been rescued from St. Helena; the coffee house frequented by Jean Lafitte, Barataria pirate, and his mate, Dominick You, who was to lead the expedition to rescue the conquered Frenchman; the Old Absinthe House, built of tiny, flat bricks brought in sailing ships from France, with its stone bar eaten deep by the water-drops of countless dripped absinthes; Congo Square, scene of ancient negro slave Voodoo dances and incantations; the old French Market, whence will come the delicacies of your table; the old French Opera House, first in America, where Adelina Patti made her debut; the Archbishopric, still inhabited, oldest original house west of the Alleghanies; the dwelling grounds in City Park, where rapiers once flashed beneath the oaks, draped in Spanish moss—but pages could be filled with what you'll see.

Nor is all historic. You'll see an ancient port, now the greatest and most modern American port next to New York, with grain elevators, cotton warehouses and Public Belt railroad owned by the city. You'll see 9,000-ton steel ocean-going freighters being built inside the city limits.

Should you care to combine with the convention some hunting or fishing or yachting or bathing or golfing—the best in the South is within half an hour of Canal Street.

"Southern Hospitality" isn't a joke or a catch-word here. It's a tradition. Almost a religion.

And it's at your command.

Come try it.

Fraternally yours,

C. V. VIGNES, President.

J. P. WAHL,

Chairman Local Committee.

THE MINNESOTA STATE MEETING.

The Minnesota State Dental Association will hold its next annual session at Saint Paul, Minnesota, February 6-7-8, 1919.

A program of unusual interest is being prepared and a cordial invitation is extended to all members of the National Dental Association, to attend this meeting.

For information address,

MAX E. ERNST, Secretary,
1125 Lowry Bldg., St. Paul, Minn.

ALUMNI SOCIETY OF THE DEWEY SCHOOL OF ORTHODONTIA.

The Alumni Society of the Dewey School of Orthodontia will hold their next annual meeting in St. Louis March 6, 7 and 8, 1919. The usual high standard of the meetings of this society will be maintained. All interested in Orthodontia are welcome. Address communications to Dr. George F. Burke, 741-43 David Whitney Bldg., Detroit, Mich.

ANNUAL MEETING OF THE ALUMNI SOCIETY OF THE PHILADELPHIA DENTAL COLLEGE.

The annual meeting of the Alumni society of the Philadelphia Dental College (Temple University) will be held on Wednesday, April 16, 1919, in the College Building at 18th and Buttonwood Sts. All members should be present.

FRANKLIN S. FLUCK,
Chairman of Publicity Committee,
2440 North 7th St.,
Philadelphia, Pa.

MEMORIAL FOR DR. JOHN R. CALLAHAN.

The Ohio State Dental Society on December 5 appointed a committee to take the necessary steps to prepare a memorial to Ohio's beloved dentist and re-

search worker, Dr. John R. Callahan. The committee appointed consists of the following:

T. IRVING WAY, Chairman,
Grafton Bldg., Cincinnati.
L. L. BARBER, Toledo.
L. E. CUSTER, Dayton.
W. A. PRICE, Cleveland.
HENRY GERMANN, Cincinnati.
E. C. MILLS, Columbus.

BOOKS AND JOURNALS WANTED FOR A NATIONAL ASSOCIATION DENTAL LIBRARY.

The Association is gathering material for a great national dental library. We need your assistance. Send us the following items: Dental text books, old or new; dental journals, college year books, college announcements, State Board dental reports, State Dental Society bulletins and programmes, State Board reports, photographs, engravings or prints of dentists; any print or picture relating to the practice of dentistry.

If the shipment weighs under fifty pounds send it by express, collect. If over that amount before sending please ask for shipping directions.

Address: The National Dental Association, 127 No. Dearborn St., Chicago, Illinois.

NORTH DAKOTA STATE BOARD.

The North Dakota State Board of Dental Examiners will meet in Fargo, January 14, 1919.

W. E. HOCKING, Secretary,
Devil's Lake, N. D.

BACK COPIES OF 1918 JOURNAL.

Several of the medical and dental libraries need extra copies of the 1918 Journal. This volume will be bound and placed on the shelves of the library for reference work. Therefore, if our readers who do not intend to bind this volume will send it to us, by express, collect, we will appreciate it.

DR. OTTO U. KING, Sec'y,
National Dental Association,
127 No. Dearborn St., Chicago, Ill.

SPECIAL POST-WAR COURSE

To be Given Under the Auspices of The Preparedness League of American Dentists at Columbia University Dental Infirmary, 35 West 39th Street, New York City, January 20th to 25th, 1919, inclusive.

The Preparedness League of American Dentists, co-operating with the Department of Advanced Courses in Dentistry of Columbia University, will give a post-graduate course of instruction in oral surgery, physical diagnosis, anesthesia, fractures, splints and dental prosthesis, at the Columbia University Dental Infirmary, 35 West 39th Street, New York City, from Monday, January 20th to Saturday, January 25th, inclusive.

The fee for the course is $50. The class will be limited in the interest of efficient instruction.

For detailed information and enrollment address The Preparedness League, care Columbia University Dental Infirmary, 35 West 39th street.

Notice—Tomorrow; today will be yesterday. Send your Check for Christmas stamps today.

KOLYNOS

Upon approaching the Second Decade of the Manufacture of Kolynos we beg to thank the American Dental Profession for the interest its Members have taken in a Method designed to secure General Sanitation of the Mouth and Throat through the office of a Dentifrice. Through their aid, our efforts to contribute something of enduring value to Oral Hygiene have been greatly facilitated.

We intend to commemorate the close of our ten years practical and scientific experience by issuing the results of actual experiments in pictorial chart form—from findings in our Bacteriological Laboratory—which illustrates the soundness of the Theory upon which Kolynos was established.

We believe every Dentist will be able to gather something of value from our investigations.

THE KOLYNOS COMPANY

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